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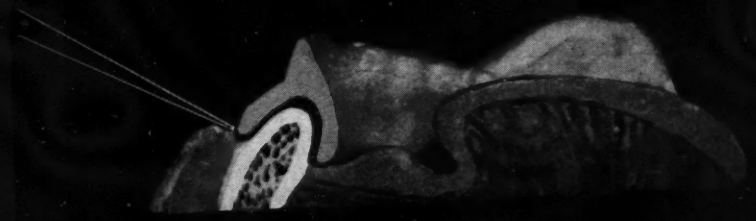

March 1952

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Vol. 58, No. 3

Dental Digest

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MARCH 1952

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About Our CONTRIBUTORS

E. T. Lewis, B.S. (University of Pittsburgh, 1932), D.D.S. (University of Pittsburgh, 1932) specializes in prosthetics and has taught many classes in this subject. In his article in the current issue, Classifications and Corrections of the Mandible for Full Denture Prosthesis, Doctor Lewis clarifies the anatomic conditions found in the edentulous lower ridge and specifies the proper procedure for each condition.

In the third and final installment of his three-part article, Juvenile Prosthesis for the General Practitioner, Doctor Louis B. Kelsten presents step-by-step procedures for constructing cast appliances of various types.

A. C. Heimlich, D.D.S. (University of Southern California, College of Dentistry) publishes the second part of a two-part article describing a highly definitive procedure, Selective Grinding as an Aid to Orthodontic Therapy.

EDWARD J. RYAN, B.S., D.D.S., Editor
WANDA T. PICKARD, B.A., Assistant Editor
708 Church Street, Evanston, Illinois

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The magazine is mailed on the fifteenth of the month of issue.

Classifications and Corrections of Mandible

for FULL DENTURE PROSTHESIS

E. T. LEWIS, B.S., D.D.S., Pittsburgh

DIGEST

Success in full lower denture prosthetics requires that a careful examination and diagnosis precede impression taking and the subsequent technical procedure.

The author of this article classifies the conditions found in the edentulous lower ridge, showing those that are most favorable and those that are least favorable for success in lower denture construction and use.

Initial Examination

The first important step in denture construction is to examine the mouth, carefully investigating the individual physiology and anatomy of each patient. When the classification to which the mouth belongs is determined dentures with maximum stability can be constructed. Examination is also helpful in estimating the amount of time required to complete the dentures, a factor concerned in estimating the fee for service.

Location of Functional Boundary—The functional boundary of the denture is interpreted as the most over-extended boundary that the muscles, attachments, and floor of the mouth will tolerate. The location of the proper boundary and floor level is necessary in order to establish maximum stability. Therefore, the important areas must be recognized during the first oral examination whether the patient presents himself before extractions or in the edentulous state. However, it is helpful to examine the patient before extractions so that corrections can be made that will provide maximum stability.

Situations Encountered

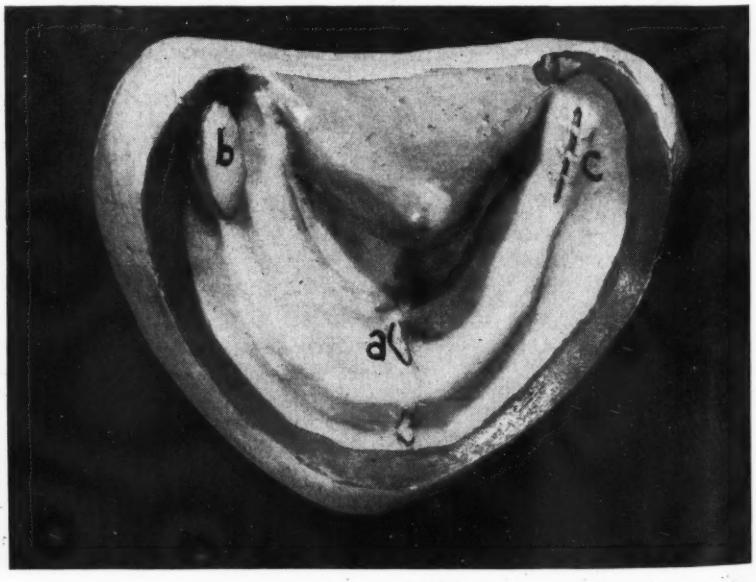
In examination of a mouth a variety of conditions may be observed. Some of these conditions must be corrected before satisfactory results can hope to be obtained. The following are the numerous conditions that may be encountered in the mouth and when necessary, the measures that should be taken to correct them:

High, Thin Ridge—A ridge of this type should be reduced. An alveolectomy is almost always necessary.

Flabby Ridge—The loose tissue forming a flabby ridge should be removed.

High Lingual Frenum (Fig. 1A)—Because this is the controlling area, special attention should be taken to note whether the frenum attachment is high or low on the alveolar ridge. If the frenum attachment is high it will be difficult and in many cases impossible, to establish a favorable seal in the final impression. The lingual frenum should therefore be released by surgery from the alveolar ridge.

Prominent Retromolar Pad (Fig. 1B)—This area is part of the sup-



1. ***(a) High lingual frenum. (b) Prominent or rolling retromolar pad. (c) Retromolar pad removed and sutured.***

porting area and should therefore be reduced.

High Muscle Attachments—If such attachments are highly functional, it is imperative that they be released. However, the author has not considered it necessary to release the high muscle attachments found in the anterior lingual region as this is a noncontrolling area.

Lingual Torus (Fig. 2)—It is a simple operative measure to remove the lingual torus and it should be performed.

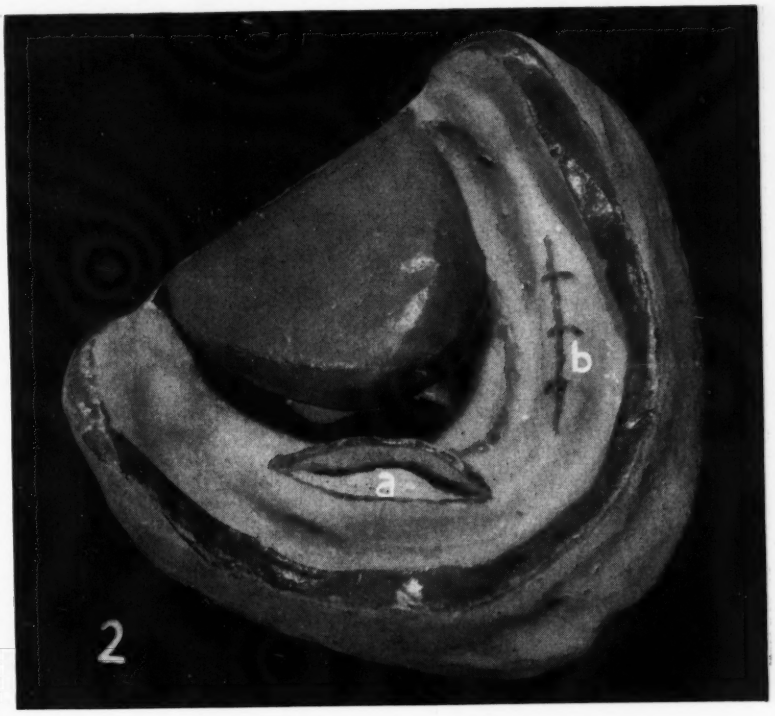
Sharp Mylohyoid Ridge with an Undercut (Fig. 3)—This type of ridge can easily be removed while a full lower extraction is being performed. However, it is slightly complicating when the condition is present in an edentulous patient, but if the incision is made over the crest of the ridge, eliminating the possibility of tearing the tissue when creating flaps, the entire operation is simplified.

High Genial Tubercle (Fig. 4)—If possible a high genial tubercle should be removed although, because of age or illness, removal is sometimes contraindicated. For correction, the incision must be made over the crest of the ridge from cuspid to cuspid and great care must be exercised in making the flap (1) to avoid tearing the tissue, and (2) in suturing after the tubercle has been removed. All bone spicules must be removed. It is therefore imperative that an aspirator be used.

Large Ridge with Interfering Undercuts—A ridge of this type must be reduced by an alveolectomy. Figure 5 shows half of the ridge properly removed.

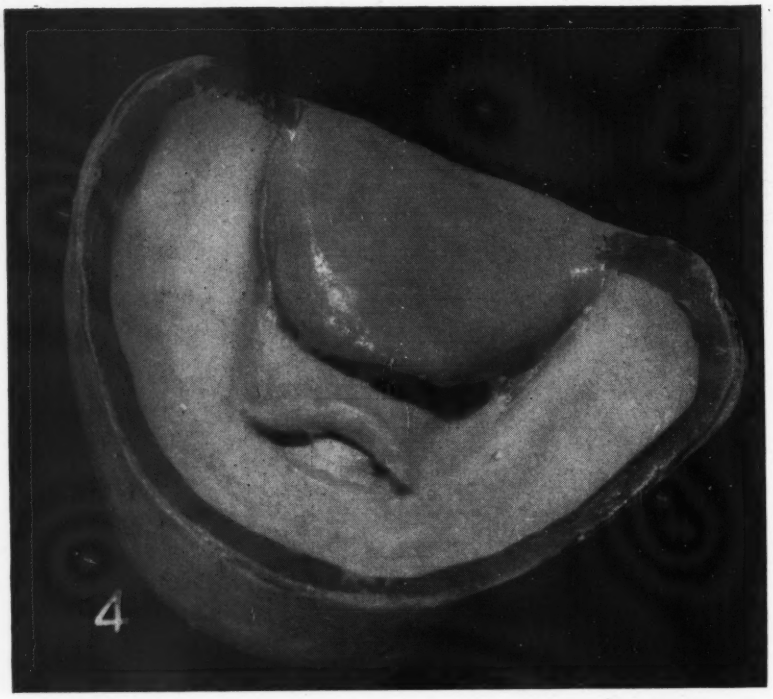
Sublingual Area From First Bicuspid to First Bicuspid—This is the major area of importance and must be thoroughly considered: (1) The height of the ridge is not important; in fact, height is a detriment to the final result in most cases. But to obtain maximum stability, a correct floor level, or boundary, must be established. A boundary should be long enough to provide a perfect seal when the tongue is in full function, without irritating the floor of the mouth. (2) The position in which the tongue places the anterior lingual floor of the mouth during function rather than the boundaries of the tongue, is the factor that provides maximum stability. (3) The posterior lingual area is not important except that if too long, the denture will be displaced when the tongue is in function. Therefore, it is imperative that this area remain noncontrolling which will occur only if the flanges are too long, or if they contact the mylohyoid muscles on the interior surface of the flange.

Buccal Fold or Supporting Area—This is the area second in importance.



2. ***(a) Lingual torus. (b) Torus removed and sutured.***

3. ***Sharp mylohyoid ridge with an undercut.***



4. ***High genial tubercle.***

5. ***Large ridge with interfering undercuts.***

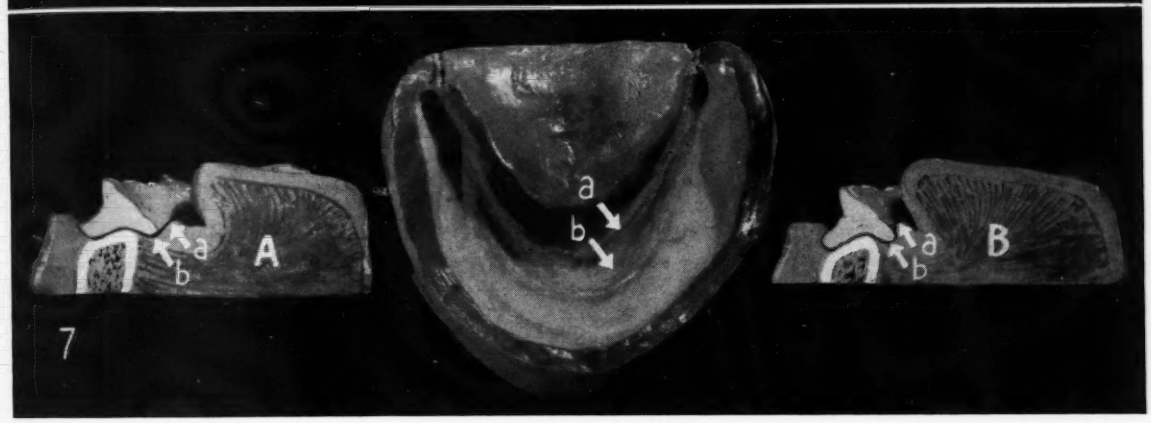
There are two types of supporting areas: (A) the flexible, functional type with its attachment on the anterior portion of the pterygomandibular ligament. This type provides a deep under-surface which extends to the external oblique ridge and covers the heels and distobuccal areas of the denture base. This is a favorable condition and aids greatly in maintaining stability. (B) The second type is the taut or nonfunctional buccal fold which is unfavorable because it does not produce a postdam seal and has its attachments on the side of the pterygomandibular ligament, virtually in line with the external oblique ridge with no under-surface.

The Ideal Lower Ridge—A ridge having a sublingual fold and fold space is ideal (Fig. 6A): (1) The correct floor level is easily obtained; in fact it can be short of the amount the boundary will tolerate and still maintain a seal when the tongue is in function. (2) A highly functional buccal fold is invariably present, making it simple to establish the correct functional boundary, thereby ensuring maximum stability. (3) The tongue in this type of ridge has complete movement without breaking contact in the controlling area because the denture is sealed even when the tongue is in the most retruded position (Fig. 6B).

Figure 6B—In this illustration the flange of the denture could be trimmed to the level of the sublingual fold and still ensure a perfect seal when the tongue is in function. If the proper floor level is established even by using a material to establish the level, the operator can pull the denture with the fingers and it will not release itself. The fact that the floor level is sealed while the tongue is in a retruded position makes this test possible.

Floating Gland Type (Fig. 7)—Another ideal mandible is one that is ridgeless with a floating sublingual gland; that is, the gland is high, and over the ridge anteriorly and posteriorly. The floating gland gives the denture a perfect seal because the sublingual fold and fold space are always present (Fig. 7A). The tongue has almost total movement without breaking the seal. This type of denture will also withstand pulling without breaking the seal. The important factor in construction with this type of ridge is to trim the flanges properly on the tray.

Undercut Mandible (Fig. 8)—Another ideal mandible is one having an undercut on the anterior ridge



6. ***Ideal mandible having a sublingual fold (a) and sublingual fold space (b). (A) Crosscut view showing sublingual fold (a) and sublingual fold space (b). (B) Crosscut view showing sublingual fold (a) and sublingual fold space (b) in relation to the denture in place.***

7. ***Floating gland type having a sublingual fold (a) and sublingual fold space (b). (A) Crosscut view showing the denture in place in relation to the sublingual fold (a) and sublingual fold space (b) with the tongue retruded. (B) Crosscut view showing denture in place in relation to the sublingual fold (a) and sublingual fold space (b) with the tongue in a half retruded position.***

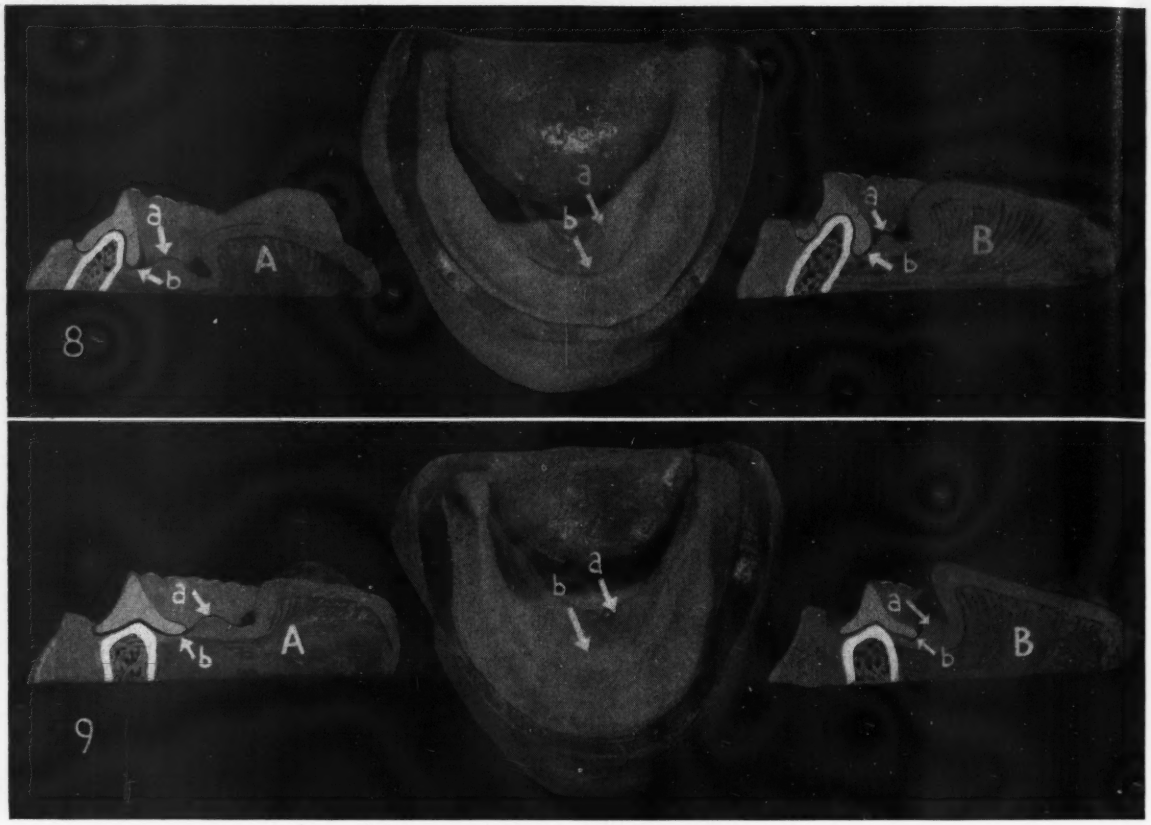
area. This type always has a sublingual fold and fold space (Fig. 8A) with the floor area rising toward the sublingual fold. The floor level can be short of the amount it will tolerate and still maintain a seal when the tongue is in function. In Figure 8B a perfect seal is shown with the tongue half retruded and the floor level at its maximum depth of the boundary it will tolerate. The floor level of the denture could be trimmed or made as short as the level of the sublingual fold shown in the illustration and still obtain a perfect seal.

Ridgeless Mandible (Fig. 9)—The amount of tongue movement allowed in this type depends on the sublingual fold level (Fig. 9A). The higher the sublingual fold level, the more tongue movement allowed. The lower the sublingual fold level, the less tongue movement permitted before the seal breaks, and of course, the more difficult it is to establish maximum stability; if the floor level is on the same plane as the ridge, the only time a seal is maintained is when the tongue is in fuction. The seal breaks when the patient opens his mouth for examination because as he opens his mouth he retrudes his tongue, which in turn releases the denture. A ridgeless lower with a low floor level and a taut buccal fold becomes more difficult.

Most Difficult Lower (Fig. 10)—This is a situation in which there is a high or prominent genial tubercle without a sublingual fold or fold space present (Fig. 10A). This is determined by sight or by placing the index finger directly over the area which is between the submaxillary duct openings and the alveolar ridge.

Obtaining a Proper Seal: It is difficult to obtain a satisfactory seal in this area since the boundary and floor level must be precise and within a millimeter of being absolutely true: (1) If the floor level is even slightly over-extended the patient will not tolerate it when the tongue is in function. (2) If the floor level is slightly short, the seal will break when the tongue functions. (3) If the sublingual fold runs distally on the same horizontal plane as the anterior portion, the problem is simpler than in the case of a sublingual fold that dips to a lower level in the distal area (Fig. 11).

Complicating Factors: A taut buccal fold complicates procedure. In this



case there is a tongue movement of less than 25 per cent. If the genial tubercle is removed operative procedure is simplified and this type of ridgeless lower becomes ideal. Balanced occlusion is imperative with this type (1) to preserve results already obtained, and (2) because the tubercle area is sensitive and cannot tolerate trauma. If care is not taken when preliminary impressions are made and the tray properly relieved, the results will be unsuccessful.

The Draping Floor Type (Fig. 12)—This type of mandible varies according to the degree of slope that the floor of the mouth drapes distally. Because this type has no interference in the anterior lingual area, it is the simplest of the drape floor types. The sublingual fold and fold space are not present when the tongue is in a retruded position (Fig. 12A). Therefore, the dentures would have no seal in this position and would be displaced. But when the tongue is in a functional position (Fig. 12B) a sublingual fold and fold space are present, sealing the denture so that maximum stability is maintained.

8. ***Undercut lower with a sublingual fold (a) and sublingual fold space (b). (A) Crosscut view showing the denture in place in relation to the sublingual fold (a) and sublingual fold space (b) with the tongue in a retruded position. (B) Crosscut view showing the denture in place in relation to the sublingual fold (a) and sublingual fold space (b) with the tongue in a half retruded position.***

9. ***The ridgeless lower having a high sublingual fold (a) and sublingual fold space (b). (A) Crosscut view showing denture in place in relation to the sublingual fold (a) and sublingual fold space (b) with the tongue in a retruded position. (B) Crosscut view showing a denture in place in relation to the sublingual fold (a) and sublingual fold space (b) with the tongue in a half retruded position.***

Drape Floor Type with Tubercle (*Fig.* 13)—The most difficult of the draping floor type of mandible is that in which there is a slight tubercle. Figure 13A shows the denture in place with the tongue in a retruded position. There is no seal at this time and the denture is released. However, when the tongue is in function (Fig. 13B) the denture has maximum stability. The sublingual fold has to make a greater arc in Figure 13A to seal the denture than it does in Figure 12A, a complicating feature in procedure with this type of mandible.

Selection of Precision Floor Level: In all draping floor types (1) if a taut buccal fold is present, or (2) if the tongue is in an awkward or retracted position when in rest or during function, the procedural problem is complicated. In these cases the floor of the mouth will tolerate a longer flange; it is surprising how much it will tolerate. If a precision floor level is selected so that the denture has satisfactory stability when the tongue is in a functional position (Fig. 13B) the patient will be gratified.

Determining Factor in Suction: In all the cases described the determining factor in demonstrating suction by

10. ***Most difficult lower having a genial tubercle with a sublingual fold (a) but with no sublingual fold space (b). (A) Crosscut view showing the denture in space relation to the sublingual fold (a) and sublingual fold space (b) present when the tongue is in a retruded position. (B) Crosscut view showing the denture in place in relation to the sublingual fold (a) and sublingual fold space (b) produced when the tongue is in a functional position.***

11. ***A difficult lower having a genial tubercle with a sublingual fold (a) that dips to a lower level in the distal area and having no sublingual fold space (b) present when the tongue is in a retruded position. (A) Crosscut view showing the denture in relation to the sublingual fold (a) and having no sublingual fold space (b) present when the tongue is in a retruded position. (B) Crosscut view showing the denture in place in relation to the sublingual fold (a) and sublingual fold space (b) produced when the tongue is in a functional position.***

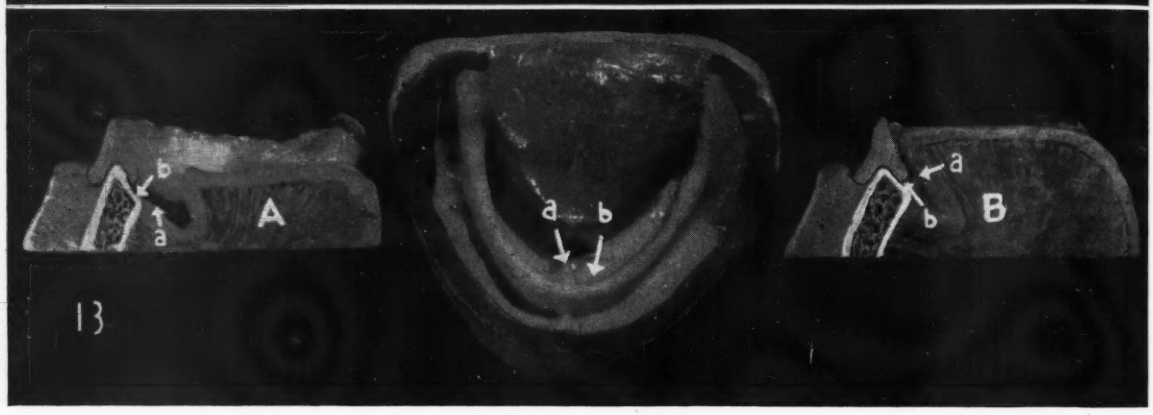
lifting the denture with the fingers when the patient opens his mouth for examination depends on the degree of tongue movement allowed before the sublingual fold breaks the seal. More than 70 per cent tongue movement can be demonstrated by lifting with the fingers. The amount of suction with lower dentures having a tongue movement of less than approximately 70 per cent can never be demonstrated because the moment the fingers are placed on the denture the tongue falls back beyond the contact level and breaks the suction.

Causes of Failures: It should be stressed that unless the dentist becomes familiar with and understands the conditions described, he will experience difficulty in establishing true and lasting peripheral boundaries. Failures in lower denture construction are caused largely by having no definite plan of boundary outlines. If a lower denture is constructed with adhesion, suction, horizontal stability, and a full functional periphery many hours of practice by the patient in learning to juggle the appliance and to control the muscles and tongue in order to hold the dentures in place will be elminiated.

Balanced Occlusion

It is imperative to select the proper posterior tooth forms for the particular classification to which the mandible under treatment belongs, and an articulator with which the operator is thoroughly familiar. Balanced occlusion is a controversial subject but great strides have been made in clarifying the procedures used to obtain it. If a lower denture is constructed with a full functional periphery so that it has (1) adhesion, (2) suction, and (3) horizontal stability, a good centric on any articulator is sufficient.

Calcification in the Mandible—The amount and speed of resorption depend on poor or good calcification of the bone. Under normal conditions the progress of aging from the prosthetic standpoint would imply a poorer calcification of the mandible generally. However, metabolism, or the rate of interchange of nutritious elements for the formation of bone,



is better in young people. Therefore, because there is a constant change taking place in the patient's ridges, probably without any static period, the change depends on the degree of calcification of the mandible.

To Preserve the Results Obtained—Even with perfectly balanced dentures there is some resorption if the mandible and maxilla have poor calcification. The time that it requires to secure balanced occlusion is well spent, especially as it is important (1) to preserve the results already obtained with impressions, (2) to minimize the degree of change or resorption that is taking place, and (3) to obtain the maximum of comfort.

Choice of Teeth

There are various types of anatomic and mechanical artificial teeth. Highly involved techniques and mechanically unsound articulators have been the cause of failures in many cases. Fournet posteriors are the author's choice in tooth design for the following reasons:

12. ***Draping floor type of mandible having a sublingual fold (a) but no sublingual fold space (b). (A) Crosscut view showing the denture in place in relation to the sublingual fold (a) and having no sublingual fold space (b) present when the tongue is in a retruded position. (B) Crosscut view showing the denture in place in relation to the sublingual fold (a) and sublingual fold space (b) produced when the tongue is in a functional position.***

13. ***Draping floor type of mandible having a tubercle with a sublingual fold (a) but no sublingual fold space (b). (A) Crosscut view showing the denture in place in relation to the sublingual fold (a) and having no sublingual fold space (b) present when the tongue is in a retruded position. (B) Crosscut view showing the denture in place in relation to the sublingual fold (a) and sublingual fold space (b) produced when the tongue is in a functional position.***

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1. They are easy to set up because they do not have interdigitating cusps and the cusps do not interlock in any movement of the mandible.

2. These posterior teeth have the advantage of cusps and ridges while they allow the same movement as a flat tooth.

(With the use of interdigitating cusps interference would increase as the vertical dimension closes, especially with the mandible making forceful anterior and posterior thrusts. As this takes place, the degree of resorption must increase because cusp interference also increases considerably.)

3. Because they are non-interdigitating, if calcification is poor and the vertical dimension closes, Fournet teeth are designed so that they do not increase interference, and the degree of resorption is decreased.

4. The comfort and efficiency of the dentures are maintained.

Designs Recommended—In favorable conditions, with a healthy patient having a well-rounded ridge the author uses Fournet posterior teeth having deep cusps (Figs. 6, 7, 8, 9,

(*Continued on page* 140)

JUVENILE PROSTHESIS

for the General Practitioner – Part Three

LOUIS B. KELSTEN, D.D.S., Newark, N. J.

DIGEST

In this, the final installment in a series of three discussions of juvenile prosthesis for the general practitioner, step-by-step procedures are described for constructing cast appliances of various types, including acrylic retainers, lingual arch appliances, and wrought bands. The proper application for each type is indicated.

Technical Procedures

In cast space maintenance construction the laboratory technique required is so simple that any competent dentist can easily learn to fabricate the various types of retainers. Spare time can be profitably used in the laboratory (1) during cancelled appointments, (2) between appointments, (3) during periods set aside for emergency patients, (4) while waiting for the cementation of an inlay, (5) during the application of sodium fluoride. Office routine need not be disturbed, nor should the dentist work longer hours as he can be employed at the chair while a poured model is hardening or during the burning out of a wax-up.

Cast Appliances

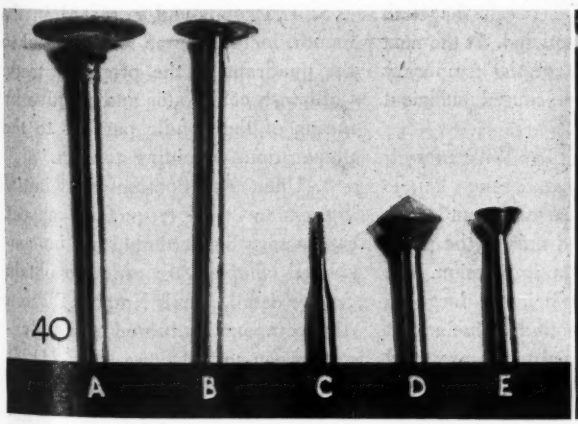
1. Where abutment teeth have deep caries (1) all caries should be removed, (2) the cavity sterilized with phenol, and (3) filled with cement or a quick-setting zinc oxide and eugenol paste.

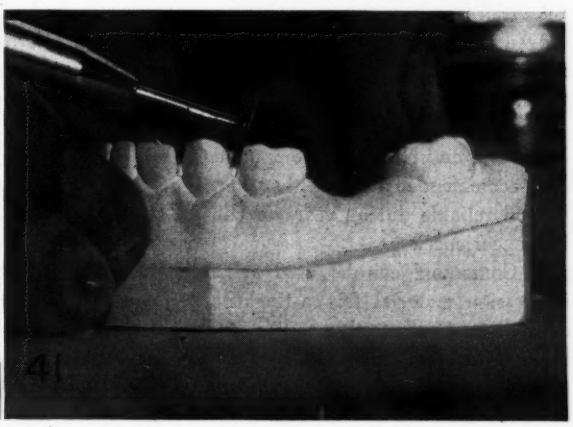
2. With a moistened knife-edge stone (one-half inch in diameter), starting on the marginal ridge of the surface involved, a slice is made to just below the interproximal gingiva. In order to decrease the number of steps, all the proximal surfaces of the abutment teeth are sliced in the same manner.

3. Using the same instrument, buccal and lingual grooves extending from near the buccal and lingual marginal gingivae up to the occlusal surface are cut through the enamel into the dentin.

4. With a moist mounted diamond-shaped stone the occlusal part is reduced and also the buccal and lingual bulges so that there are no undercuts on these axial surfaces.

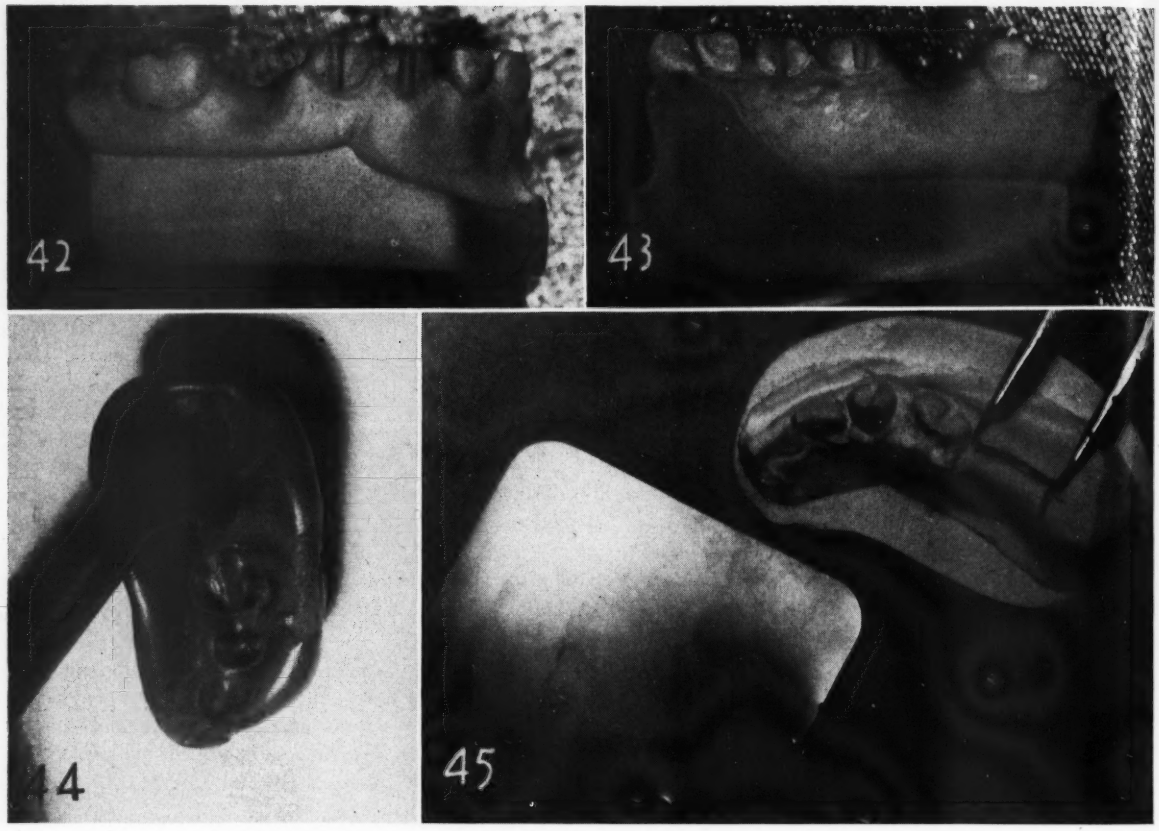
5. With a Number 701 tapered fissure bur all the grooves are sharpened (Figs. 40, 41, 42, and 43). Note





40. *Rotating instruments used in preparing the primary teeth for cast space maintainers. (A) carborundum stone, or (B) diamond instrument can be used for slicing proximal surfaces and beginning the grooves. (C) Number 701 tapered fissure bur for sharpening the grooves. (D) or (E) can be used for reducing the occlusal and axial surfaces.*

41. *Preparing the proximal slice. Note how the slice is made at the expense of the marginal ridge in order to avoid injuring the adjacent tooth.*



42. ***Buccal view of prepared teeth. Note the grooves for added retention.***

43. ***Lingual view of prepared teeth.***

44. ***Rebasing the original impression with low fusing green stick compound. Note how the impression material is dripped into the imprints of the prepared teeth and the tray is immediately reseated. The low fusing compound will not burn the child.***

45. ***Determining the position of the horizontal and vertical bar by means of x-rays.***

the small number of instruments employed and the simplicity of the steps in the preparation of the abutment teeth.

Materials Recommended—1. Kerr's Number 1 and Number 2 compounds are recommended because they have proved reliable during years of clinical experience.

2. Compound can be used as an impression material for castings because the primary teeth are short and relatively free of undercuts.

3. Although compression can be obtained with compound, this material will not push hyperplastic gingiva out of a cavity or away from a slice preparation. Silver nitrate should be applied and the gingival tissue excised, or preferably gutta percha is packed between the teeth and the patient dismissed. At the next visit, the pressure of the temporary stopping will have caused sufficient gingival recession.

Use of Tray—1. The Willett tray is recommended because the handle helps in seating the compound with thumb pressure and aids in the proper withdrawal of the impression. The tray should be sufficiently large to hold enough compound to include at least one tooth mesial to the prepared teeth.

2. The tray is filled with impression compound that has been softened in hot water (155 degrees Fahrenheit). The surface of the compound is flamed and tempered in the hot water.

3. The compound is seated in the mouth, including one tooth mesial to the quadrant of the prepared teeth. Chill with cold water and remove by means of the handle parallel to the preparations, avoiding torsion.

4. Upon examination this initial impression will frequently appear satisfactory but it should not be considered complete. In order to obtain greater detail, Kerr's Number 2 green stick compound is heated over a Bunsen burner until it flows (Fig. 44). It is then dripped into the imprints of the prepared teeth and the tray is immediately reseated over the preparations with thumb pressure, chilled, and removed.

Checking for Accuracy—1. In checking the rebased impression for

46. ***Investing the wax-up. Note the use of a stainless steel sprue (gauge 14) to facilitate handling the case.***

47. ***Appliance in the mouth.***

accuracy the gingival margin and grooves are examined. If these are not sharp in detail, the imprint can again be rebased with the lower fusing compound.

2. It is also suggested that two impressions be taken of each case. Later the more satisfactory model can be chosen for waxing.

3. Because the young permanent tooth is partly erupted and therefore comparatively free of undercuts, the impression technique described can be used for the fabrication of cast bands.

Investment Model—1. Crystobolite model investment is used for the investment. With the thumb and forefinger boxing the impression, a thick mix is vibrated from one corner of the impression until the teeth are filled.

2. The impression is gently tapped on the bench to liberate any bubbles that might have been trapped.

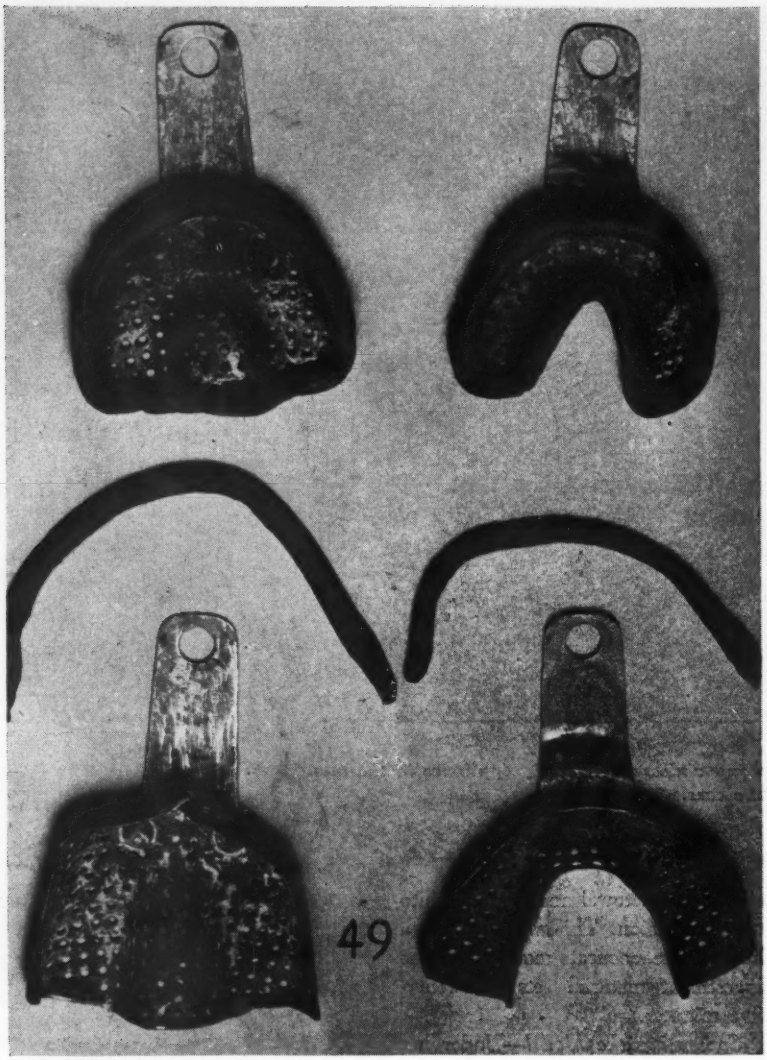
3. The remaining investment material is blotted to a putty-like consistency in a towel and vibrated into the impression. This will furnish a hard, dense, accurate model when the investment material sets in twenty-five minutes.

Separating the Model—Under hot tap water, the model is carefully separated. Where pieces of compound remain between the teeth or in the grooves it is not advisable to remove them with a sharp instrument. The model is reimmersed in the hot water and some of the used red compound that has been resoftened in the hot water is placed against the retained fragments. When withdrawn, the red compound will remove the fragments without flaking the model.

Completing Contours and Anatomic Markings—1. When the model has dried sufficiently, two layers of Kerr's soft green wax (Number 28-gauge) are placed on the abutment teeth. With inlay wax the contours and anatomic markings of the wax crowns are completed.

2. After the gingival trough of the tooth on the model is made 2.0 millimeters deeper with a sharp pointed instrument, two layers of Kerr's soft green wax are laid down for the cast band. This will make it possible for the finished band to fit directly un-

48. ***Roentgenogram showing the appliance in Figure 47 guiding the eruption of the six-year molar. The appliance should now be removed and the vertical part of the bar cut. The appliance should then be recemented so that the six-year molar is maintained in position until the bicuspid erupts.***



49. *Inexpensive perforated trays are cut to the size of the primary dentition and rimmed with mortite.*

der the gingival for greater retention.

3. Number 14-gauge wax is used for the bar in order to supply ample bulk for strength during mastication.

X-ray Utilized—1. Where the second primary molar is missing and the six-year molar is unerupted, the distance between the distal of the first primary molar and the mesial of the unerupted first molar is determined by means of x-ray (Fig. 45).

2. The distance is then laid off on the model with a pencil mark in the form of a line running parallel with the distal slice of the first primary molar.

3. Using the study casts of the child's mouth the buccolingual position of the bar is determined and marked lightly on the model.

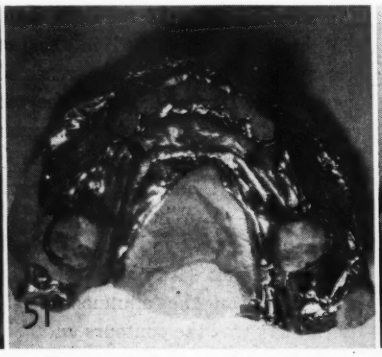
4. A hole is drilled about 2 millimeters mesial to where the two lines meet and carried to the depth required by the x-ray picture.

Sprues Attached—1. When the wax-up of the space maintainer is completed, excess investment is cut away and short thick sprues with wells are attached to the bar and to the individual crowns.

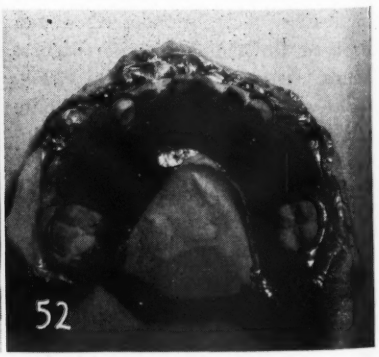
2. The model is moistened in room temperature water and reinvested in an inlay ring for wax elimination and casting (Fig. 46).

Bubbles Eliminated—1. After pickling and polishing the inner surfaces with a black bristle brush and pumice the casting is examined for bubbles with a magnifying glass and all bubbles are eliminated with a small round bur.

50. *Buccal arm clasps for the acrylic denture type of space maintainer.*



51. *Tin-foiling the case.*



52. *The wax-up.*

2. Little or no grinding is required for the external surfaces of the castings if the original anatomy of the prepared teeth is restored properly.

3. The appliance is polished on the lathe. This can be done on the rejected model.

Appliance Placed on Abutment Teeth—1. Where the space maintainer has a bar which extends to an unerupted tooth (1) the tip of the vertical part can be sharpened, (2) a local anesthetic applied to the area, and (3) the appliance placed on the abutment teeth. Because the alveolar bone in this area is soft long after a tooth has been extracted, this can be done safely provided the space maintainer has been sterilized in a germicidal solution.

2. After x-raying the area and making necessary adjustments, the tip of the vertical part of the bar can be smoothed and the appliance cemented in position.

53. ***Trial-packing the case.***

54. ***Finished acrylic retainer. If desired, occlusal carvings can be made in the saddle area.***

55. ***Appliance in the mouth.***

3. The patient should be recalled for periodic checkup (Fig. 47).

Eruption of Bicuspids—1. When the six-year molar erupts, the vertical section of the bar is carefully cut so that the remaining horizontal part maintains this tooth in position until the bicuspid erupts (Fig. 48).

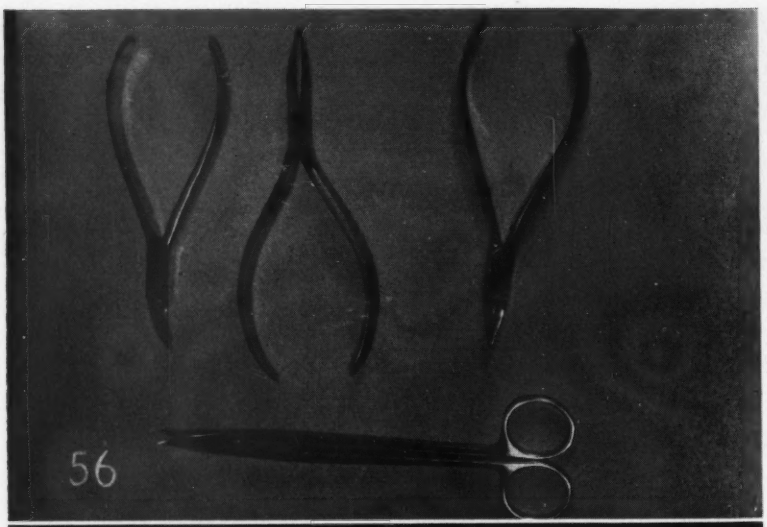
2. Normally, the second bicuspid erupts after the first bicuspid but where the second primary molar has been prematurely lost, both bicuspids frequently erupt simultaneously. When this occurs, the crowns are separated with a Joe Dandy disc so that all that remains of the appliance is the cast crown on the cuspid.

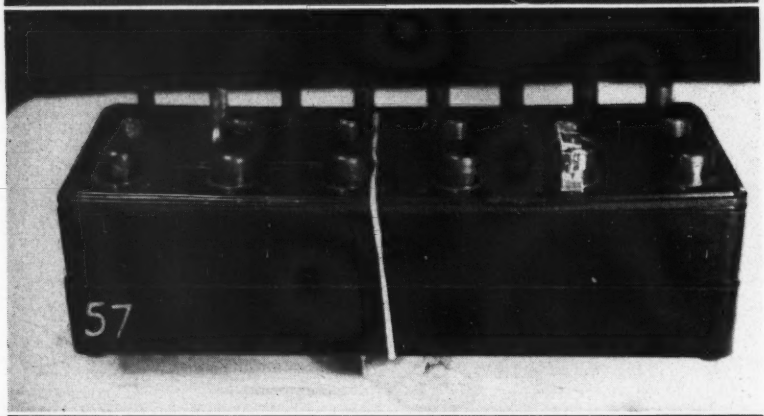
Acrylic Retainers

Before taking an alginate impression for study models or partial dentures, it is advisable to have the child rinse with a mouthwash and then to show him the impression trays. Calling them "dishes" and explaining their use is helpful. Letting him handle the tray and telling him that it will hold a material that looks like "pudding" but should not be swallowed will stimulate his curiosity and gain his cooperation.

Measures to Increase Patient Comfort—1. Trays of proper size and the correct amount of impression paste must be used to avoid gagging the patient and thereby alarming him.

2. Mortite, a putty-like material which can be purchased at a hardware store, is used to rim the trays for confining the alginate material





56. *Instruments used for fabricating wrought bands.*

57. *Gauges on the copper band case used for making stock bands of assorted size.*

58. *Wrought bands are stored in plastic case for quick selection of proper size.*

(Fig. 49). The patient is seated upright and the lower impression is taken first since it is more readily tolerated.

Technique—The fabrication of acrylic retainers is not complicated and can readily be done by dentists who wish to make their own acrylic appliances:

1. With a fine notched beak plier, stainless steel 19-gauge wire for buccal arms clasps for the primary cuspids and molars is bent below the height of contour mesially, buccally, distally, and then away and down interproximally and lingually.

2. The lingual part of the clasp should stand about 1 millimeter from the model to allow acrylic material to flow under the wire.

3. The lingual end of the clasp is bent into a hook for retention in the material (Fig. 50).

4. Before waxing it is advisable to outline the case on the model. As clear acrylic is used the model is tinfoiled so that the foil will not be separated during the removal of the wax (Fig. 51).

5. The clasps are attached to the model with sticky wax and two layers of baseplate wax are laid down in the outlined case.

6. With a hot wax spatula the wax is attached to the model. Care should be taken that there is enough wax in the interproximal area, and up to 1 millimeter on the lingual surfaces of the teeth.

7. The saddle areas are waxed up to the occlusal height of the adjacent teeth (Fig. 52).

8. After sufficient wax has been laid down, occlusal carvings and outlines for individual teeth can be made in the saddle areas and the anterior lingual interproximals trimmed so that they are sharp in outline.

9. The wax is then smoothed and polished with cotton saturated with soapy water.

Investing—The banking method is used for investing the case: 1. The case is covered completely except for the wax surfaces, taking care to eliminate all undercuts with plaster.

2. After the lower half has set and has been painted with a separating

medium, such as silicate soda, and soaked with water for ten minutes, the counter-half is poured.

3. When the upper half has set, the flask is placed in a pan of water and heated just below the boiling point to soften the wax sufficiently for removal.

4. The flask is opened, the wax removed, and both halves of the flask are flushed with boiling water.

5. After the flask has cooled and dried, the upper half is tin-foiled and the case is ready for packing with acrylic. In a clean jar the polymer and monomer are thoroughly spatulated until the mix becomes thick and doughy. The jar is then covered and set aside for several minutes until the material is elastic in consistency.

Succeeding Steps—1. In packing the case a piece of acrylic is placed over the outlined area and covered with wet cellophane. The case is trial-packed in a strong metal press.

2. After three minutes, the flask is opened and checked for sufficient material (Fig. 53). If there is enough acrylic, the excess is trimmed with a sharp instrument and additional material is added in the thickest area of the appliance for increased density.

3. The case is closed slowly and kept in the press for at least ten minutes.

4. In a compensating press frame the flask is placed in a pan of room temperature water which is heated to 160 degrees Fahrenheit and maintained at this temperature for three hours.

5. The temperature is slowly raised to the boiling point and the case given a final processing for one hour at that temperature.

6. The flask is then bench cooled for twenty minutes and inserted in cold water for at least thirty minutes before opening.

7. After the case has been removed from the investment it is trimmed carefully, smoothed, and polished on the lathe. The finished case should be kept in water until it is inserted in the patient's mouth (Figs. 54 and 55).

Lingual Arch Appliances And Wrought Bands

The dentist who deals with children should learn how to construct the passive lingual arch which is frequently required for space maintenance: 1. With cast bands on the six-year molars a compound impression is taken, a thin layer of wax is placed on the inside of the bands, and a model is poured.

2. Arch wire of a low carat gold (gauge 0.040) is bent so that it is in contact with the lingual surfaces of the mandibular incisors, preventing their lingual collapse.

3. With 14-carat solder the arch wire is soldered to the bands while the appliance is tacked down on the model with putty in the incisor region.

4. Low carat wire can be adapted into position under a flame; little skill and experience are therefore required in fabricating a satisfactory lingual arch.

5. Where the maintenance of individual teeth is desired, a spur of the same gauge wire is soldered to the arch wire.

Orthodontic Bands

Where the general practitioner desires to use orthodontic bands, stainless steel is recommended because of its strength, economy, and ease of manipulation. The bands can be spot welded; this simplifies and improves the quality of the result.

Equipment—The only equipment necessary is a welding machine which is comparatively inexpensive considering the many uses it has: matrix bands for amalgam and plastic restorations, orthodontic bands, space maintainers, splints, and inclined planes. Band material 180 by 0.006 for permanent molars and 150 by 0.004 for deciduous molars and anterior teeth is used.

Technique—1. For bands on posterior teeth, with the Howe pliers near the mesiobuccal cusp, the band material, one and three-quarter inches long, is pinched about the tooth, removed from the mouth, and a weld is made as close to the crease as possible.

2. A piece of the band material is placed inside the band under the welded joint and three welds are made at opposite sides of the preliminary weld.

3. Excess is cut away from the joint and the inner piece, and the joint is smoothed with a stone and disc.

4. The band is replaced and readapted on the tooth. Wherever the band stands away, slits are made with curved scissors to a depth of one-half of the band. The laps of the slits are readapted to the tooth and welded in position (Fig. 56).

Anterior Bands—1. With the Howe pliers at the lingual surface, the anterior band material is tightly pinched about the tooth, removed from the mouth, and a weld made as near to the crease as possible.

2. The ends are cut, leaving 3-millimeter stumps.

3. The band is replaced on the tooth, readapted with a plastic instrument, and the stumps bent over and burnished to the tooth.

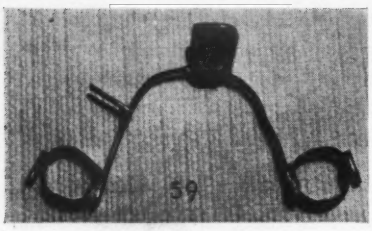
4. The band is removed, the stumps given several welds, and smoothed with a stone and disc.

Wrought Bands of Various Gauges—Where a wrought band is required for a partly erupted six-year molar, it can be made with greater comfort to the child (1) by working indirectly on a model of the tooth from a copper band and compound impression, or (2) by the selection of a prefabricated band (Fig. 57). This method of making wrought bands of the various gauges has proved satisfactory for the author.

Bands Kept in Stock—Numbers 7, 8, 9, 10, and 11 for the first deciduous molar and bicuspids; Numbers 12, 13, 14, and 15 for the second deciduous molar; Numbers 4, 5, and 6 for the primary and permanent cuspids; Numbers 14, 15, 16, and 17 for the first permanent molars are the different sizes which can be kept in stock and quickly selected for a child (Fig. 58).

Requirements of a Wrought Band—A wrought band should meet the following requirements:

1. It should slip over a tooth eas-



59. *Lingual arch. Note how this appliance can be used as a space maintainer or for the temporary replacement of a missing tooth. Also, if desired, spurs can be added to curb a persistent thumb-sucking habit.*

ily, have adequate retention, and not injure the gingival attachment.

2. It should not stand away from the tooth at the gingival and occlusal margins.

3. It should have a smooth and well-polished joint.

4. It should be made of a material that is strong and nontarnishable.

Method for Obtaining Accuracy—For the lingual arch, stainless steel 0.034 wire can be used and joined with silver solder to the bands. While working on a model or even in the mouth, greater accuracy is obtained by using a pencil mark on those points of the wire where the bend is required. After the appliance has been soldered it can be pickled in acid and polished with a rubber wheel (Fig. 59).

Wrought Bands vs. Castings—The dentist's decision to use wrought bands rather than castings for space maintenance must rest upon what is best for the particular case: 1. Wrought bands should not be used because they are more rapidly made.

2. Where a first or second deciduous molar is missing in a child of three, for example, the cast space maintainers previously described are more durable, functional, and compatible to the tissues over a period of many years than any other type of appliance.

3. Where a second deciduous molar is missing and the six-year molar is unerupted, the one-piece cast appliance with the alveolar extension will best serve the patient.

4. Where teeth are in occlusion, thus preventing extrusion, and a succeeding tooth will erupt within a year or so, wrought bands with wires can be considered.

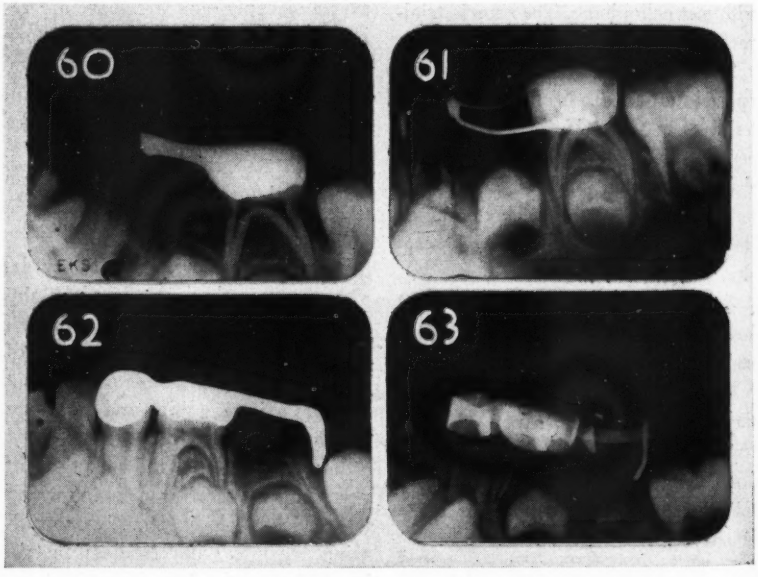
5. For a functional space maintainer required for many years, as in fixed bridges, full cast crown abutments will serve to the best advantage. The time saved in avoiding repairs and recementation makes the use of a cast appliance worthwhile (Figs. 60, 61, 62, and 63).

Final Considerations

1. Before cementing bands or an appliance, care should be taken that abutment and contacting surfaces are clean and free of caries. Much of the decalcification found under bands or adjacent to a space maintainer may have had its origin prior to the use of such appliances. Therefore, all abutment or anchor teeth should be carefully cleaned, dried, and examined for structural defects before cementation of a retainer.

2. All wrought bands should be checked for loosening and possible breakage every two or three months and removed annually to permit prophylaxis and reexamination to protect the child against caries, commonly associated with orthodontic appliances.

299 *Clinton Avenue.*



60. *Cast functional space maintainer.*

61. *Wrought band and crib wire type of nonfunctional appliance.*

62. *Cast space maintainer with alveolar extension.*

63. *Retainer employing wrought bands and pontic with alveolar extension.*

SELECTIVE GRINDING

As an Aid to Orthodontic Therapy

Part Two

ALBERT C. HEIMLICH, D.D.S., Santa Barbara, California

DIGEST

This is the final installment of a two-part article which deals with the importance of stabilizing teeth in their new positions after orthodontic treatment by removal of points of interference as a means of avoiding trauma to dental structures.

In this section of the article techniques in later treatment are discussed, possible exceptions to the rules previously presented are enumerated, and various situations in which teeth are misplaced or traumatized by over-occlusion, are illustrated. Proper materials to be used in applying the technique are recommended.

Later Examination

For purposes of comparison the case described was photographed a year after equilibration was completed. The following observations were recorded:

1. Originally the malocclusion was a deep overbite (Fig. 31). After one year there had been no recurrence as can be seen in centric position (Fig. 32).

2. Protrusive position shows no change and protrusive excursion is normal (Fig. 33).

3. The mesiodistal relationship of the cusps in the right centric (Fig. 34), and in left centric (Fig. 35) have not changed.

4. Right lateral excursion remains appreciably the same except that the right lateral is slightly out of contact (Fig. 36). This was easily corrected by a small amount of grinding on the upper cuspid and first bicuspid.

5. Left lateral excursion has not changed (Fig. 37).

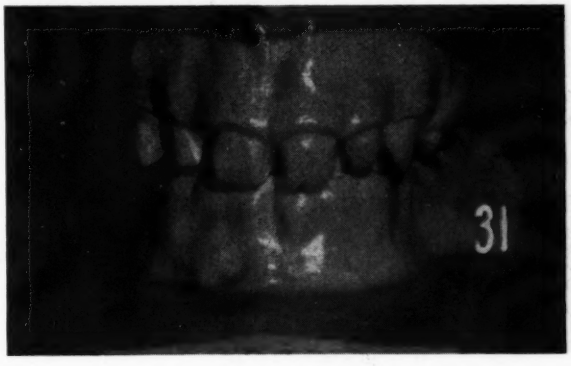
Exceptions

It was previously stated that most of the equilibrating should be done during the retention period. However, it is often expedient to do some grinding (1) before the placement of bands, (2) sometimes during active treatment, and (3) on occasion, as long as two or three years after retention.

The following are some of the exceptions to the previous statement:

1. In Figure 38 is shown a restoration which is devoid of anatomic carvings. Note the round bright area in the center of the restoration denoting over-occlusion. Figure 39 shows the same tooth after the anatomic carvings have been restored previous to band placement. If there are any teeth obviously malformed, they should be touched up to give them a semblance of the normal. For example, note the exaggerated incisal points on the upper and lower cuspids (Fig. 39A). These were modified before band placement to facilitate treatment and to improve final esthetics, as seen in Figure 39B.

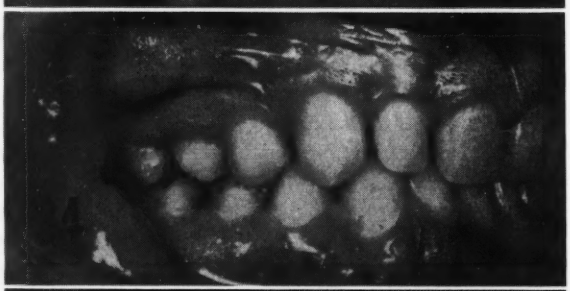
2. Cuspids that must serve as laterals (Fig. 39C) should be fashioned as such, preferably before treatment (Fig. 39D). This also helps band placement, improves final esthetics, and will aid in treatment.



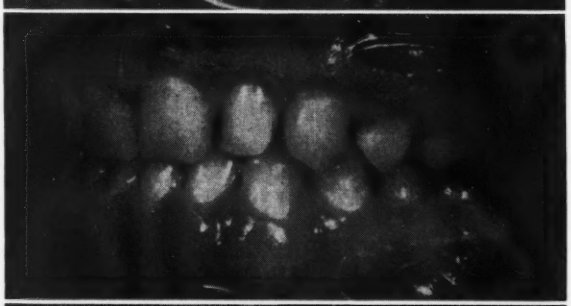
31. ***The next six photographs were taken one year later for purposes of comparison. Originally the malocclusion was a deep overbite.***

32. *There has been no recurrence one year later as shown in centric position.*

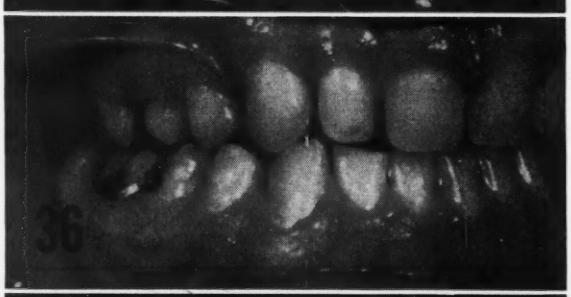
33. *Protrusive position shows no change and protrusive excursion is normal.*



34. *The mesiodistal relationships of the cusps in right centric have not changed.*



35. *The mesiodistal relationships of the cusps in left centric have not changed.*



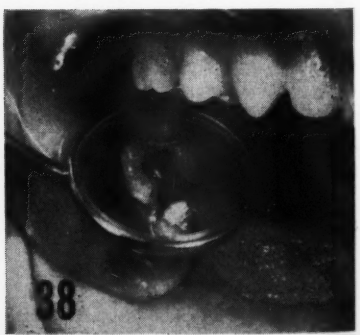
36. *Right lateral excursion remains appreciably the same except that the right lateral is slightly out of contact. This can easily be corrected with a small amount of grinding on the upper cuspid and first bicuspid.*

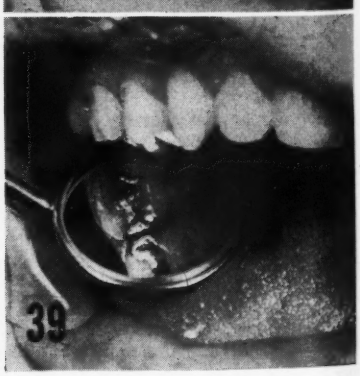
37. *Left lateral excursion has not changed.*

3. In Figure 40 the bands have been placed, taking into consideration the irregular and projecting incisal edge of the lower right lateral. If left projecting it might interfere with the mechanics of treatment. The lateral is therefore reduced at this time to its normal size *before* treatment is started (Fig. 41).

4. During treatment it may be found that over-large transverse ridges and malformed cusps and restorations interfere with Class II mechanics. Note in Figure 42 the transverse ridges on the upper left first bicuspid which undoubtedly would strike buccal cusps below during Class II mechanics. An adjustment of the appliance is not always the answer and often some grinding is indicated.

5. In rare instances, long after treatment is concluded, it may be observed that a mesially inclined second or third molar is disturbing occlusion (Fig. 43). As these teeth are not readily movable, mandibular displace-





38 and 39. *A situation where occlusal equilibration is indicated before treatment. Here it was necessary to provide some anatomy in a dental restoration.*

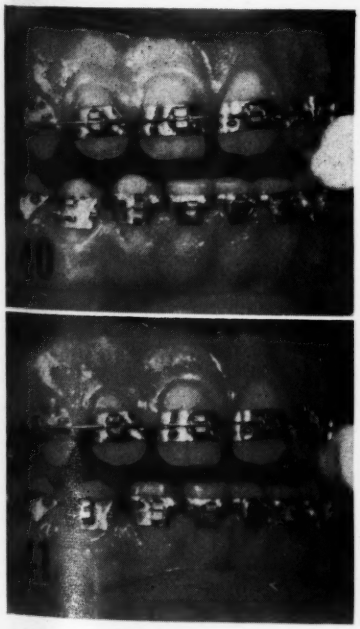
ment often follows with the usual untoward symptoms in the fossa area. The offending teeth should be relieved according to the principles outlined.

Teeth Can Be Displaced or Traumatized by Over-occlusion

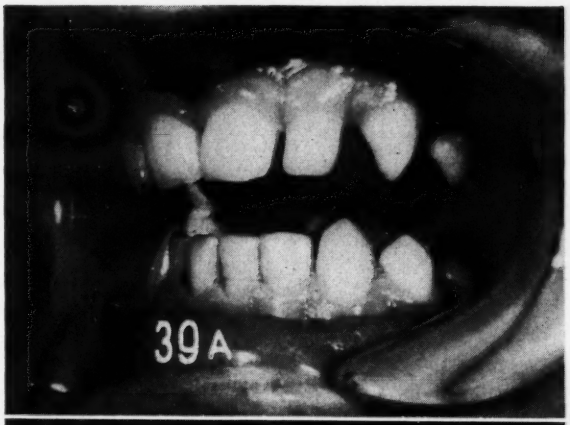
The following illustrations emphasize the fact that it is possible to displace or traumatize teeth by over-occlusion:

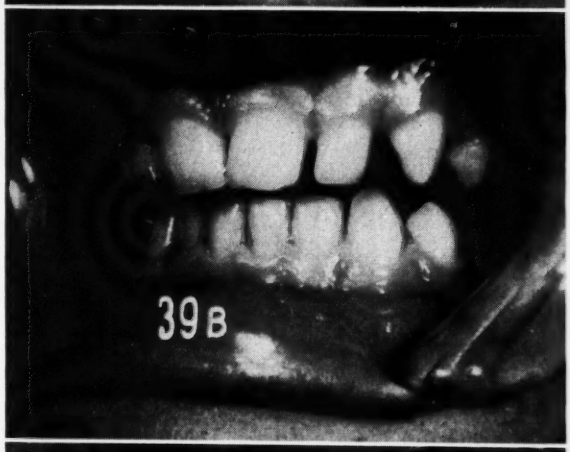
Figure 44—A condition of over-occlusion on the mesial slope of the upper cuspid against the distal slope of the lower cuspid is shown. The lower cuspid, lateral, and central have been moved mesially en masse from forces exerted during right lateral excursion (Fig. 45). The correction is made by grinding the mesial slope of the upper cuspid and the distal slope of the lower without disturbing the centric points of contact.

Results of Traumatic Occlusion—In Figure 46 a definite enlargement of the periodontal membrane is shown about the root of the right lateral. The occlusion was adjusted and after an



40 and 41. *Equilibration at the time of band formation. Adjusting incisal level of lower right lateral incisor.*





39A and 39B. *Cuspids are modified to simulate their normal appearance before treatment.*

39C and 39D. *Cuspids are fashioned as laterals before treatment.*

interval of two months improvement can be observed in the affected area (Fig. 47).

Small Amount of Equilibrating Usually Needed

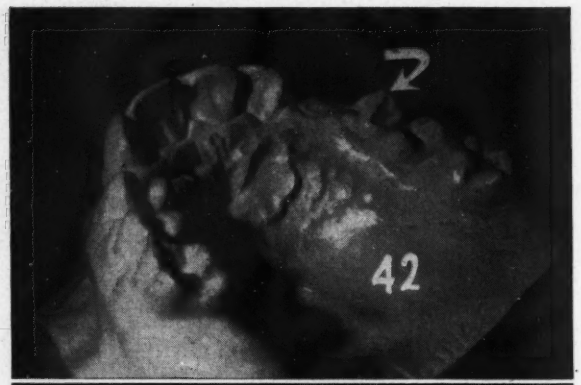
That most mouths that have been treated orthodontically require only a small amount of equilibrating is shown in the following illustrations:

Figure 48—Centric position needed no adjusting.

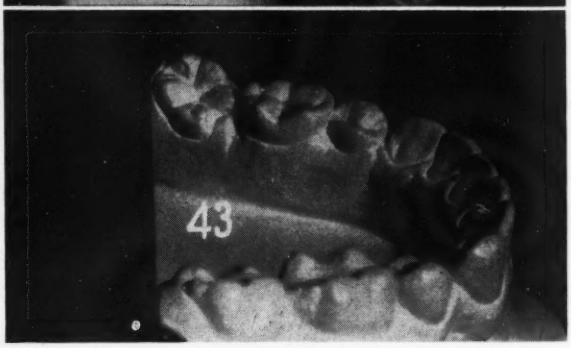
Figure 49—Protrusive position needed a slight correction. This was accomplished by relieving the lingual incisal of the upper right central (Fig. 50).

Figure 51—Protrusive excursion was normal. The left cuspids were the only interfering contacts in lateral movements.

Figure 52—The upper cuspid was ground. Improvement in function from grinding is shown.



42. *A transverse ridge which should be modified before treatment.*

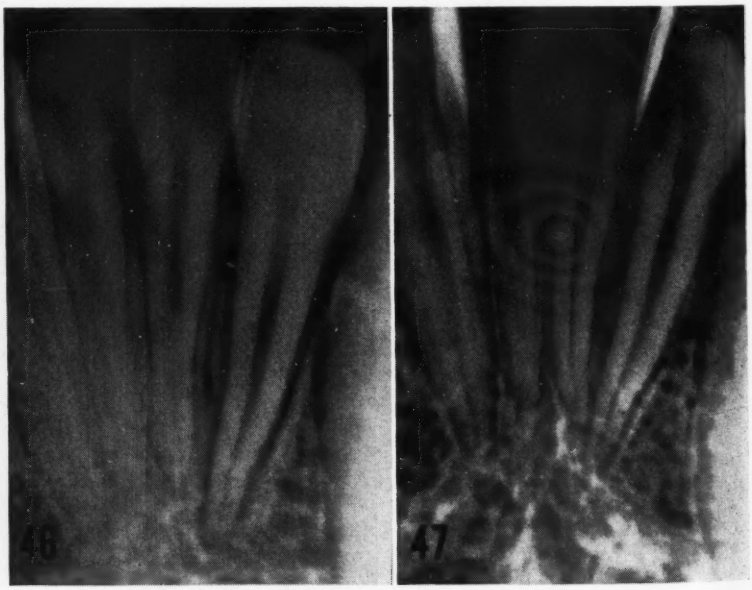


43. *A mesially inclined and rotated second molar which requires grinding subsequent to retention.*

Materials Recommended

1. All grinding should be done with small stones, preferably diamond.
2. The ground surfaces should be polished with rubber discs.
3. Abrasive pastes are definitely contraindicated because they are not selective in their application and will close the bite if used to any extent.
4. There is seldom a need to grind enough tooth surface away to produce sensitivity. However, if this does occur and does not gradually disappear, one or two applications of zinc ferro

44 and 45. *Showing heavy occlusion on a mandibular cuspid and the consequent irregularity in the mandibular incisors.*



46 and 47. *Roentgenographic evidence of the beneficial tissue changes which can follow occlusal equilibration.*

cyanide solution will remove the sensitivity.

5. The relief of interfering surfaces will not make a way for caries because the areas involved are self-cleansing.

Comments

It is emphasized that at the time equilibrating of an orthodontic case is completed several months after treatment, no attempt is made to grind every tooth into perfect occlusion. The teeth will be in a state of flux for several years to come and equilibrating must be conducted accordingly.

Natural Process Aided—The objective is to relieve the gross points of interference during the retention period and thereby help the teeth to settle into a more normal occlusion. Above all, do not try to imitate the periodontist who treats established dentitions and is therefore justified in excessive grinding to obtain satisfactory occlusion.

Proficiency Developed—If the method for equilibration described is used for a period of time it will become apparent that the rules mentioned, like all rules, have exceptions. By using ingenuity and good judgment the dentist will recognize these exceptions and will become increasingly more proficient in the technique. It must always be remembered that tooth structure once removed is lost forever. Irreparable damage can be caused if the greatest of care is not used.

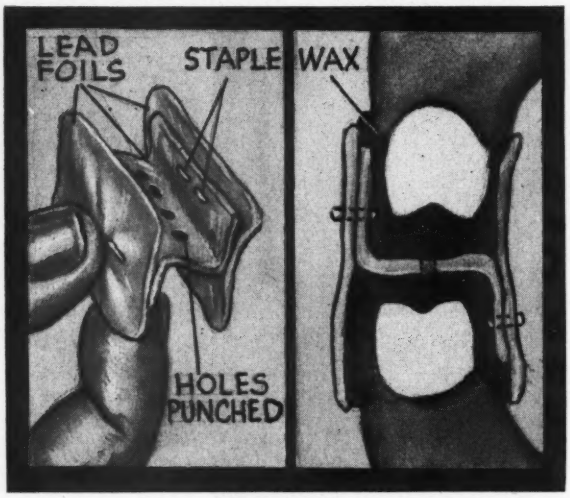
Conclusion

It is the belief of the author that the judicious elimination of points of interference in finished cases will do much to stabilize the teeth in their new positions and will help avoid trauma with its resultant damage to the teeth and to their surrounding tissues.

This can best be accomplished (not by haphazard measures) but by having a definite plan of procedure which is instituted at the beginning of treatment and followed as closely as possible until the teeth have definitely settled into occlusion.

1824 *State Street.*

48, 49, 50, 51, and 52. *A case showing the small amount of equilibration needed in most mouths that have been treated orthodontically.*



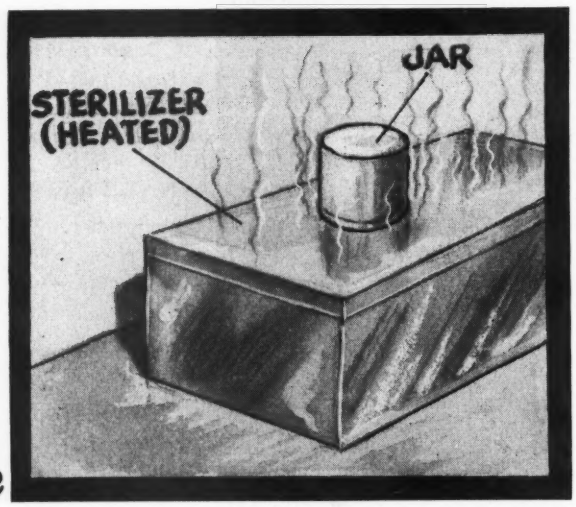
1

Clinical and Laborato

A Device for Taking a Wax Bite

H. J. Turkheim, D.M.D., London, England

1. Three discarded lead x-ray foils are used and stapled together as shown in the illustration. Holes are punched in the middle foil that receives the occlusal impact when the wax bite is being registered.

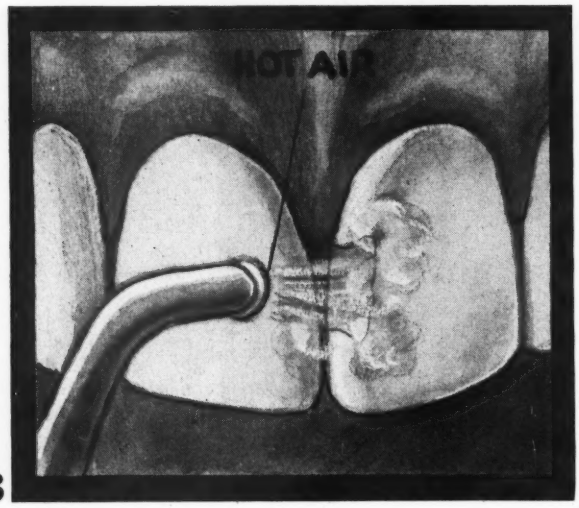


2

Heating the Polymer for Nonpressure Acrylic Restorations

Henry Fischer, D.D.S., Bronx, N.Y.

2. In using the Nealon nonpressure compensating technique for plastic restorations it is necessary to heat the jar in which the powder is to be placed to accelerate polymerization. A simple way to do this is to place the jar on the lid of the hot sterilizer.



3

Hastening the Processing of Acrylic

Robert H. Huntington, D.M.D., Tempe, Ariz.

3. When using the brush technique in inserting plastic restorations better and faster results can be obtained by blowing hot air on the material after each bit is inserted with the sable brush. An almost instantaneous curing of the material results. After the last insertion is made, continue blowing hot air on the restoration for five minutes.

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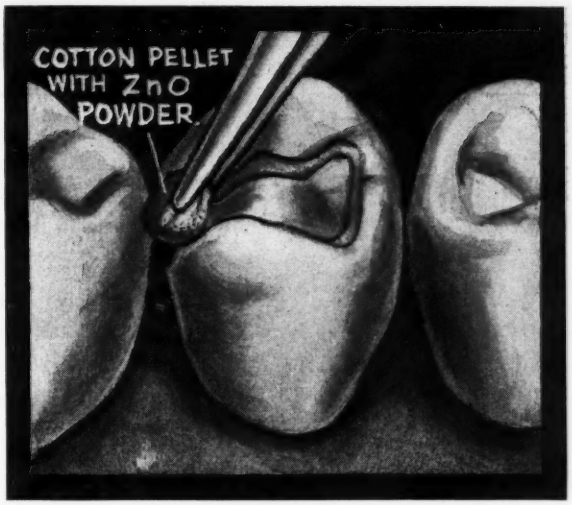
SUGGESTIONS . . .

Insertion of a Protective Base

Donald H. Hobbs, D.D.S., Pikesville, Md.

4. In the placement of a zinc oxide-eugenol protective base in deep cavities a cotton pellet dipped in zinc oxide powder will be helpful in molding the base. The material will not stick to the cotton pellet.

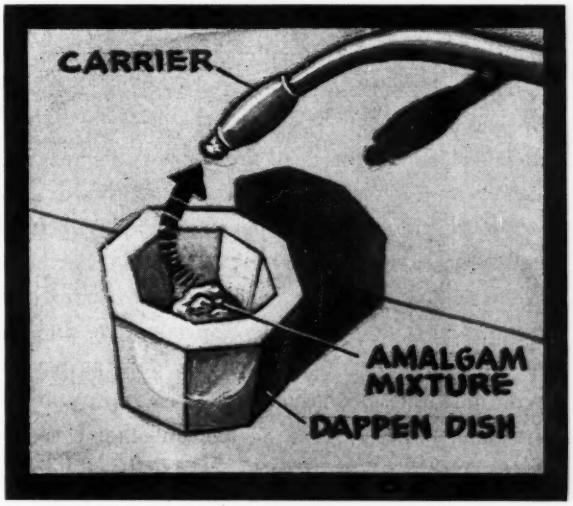


4

Loading an Amalgam Carrier

Marjorie Ruoss, R.N., Glenwood Springs, Colo.

5. A dappen dish makes a suitable receptacle from which to load an amalgam carrier. After the amalgam mixture is wrung to the desired dryness in a squeeze cloth, the amalgam is emptied into the dappen dish. The dish is useful because it keeps the mixture centered in one mass and permits easy loading of the carrier.

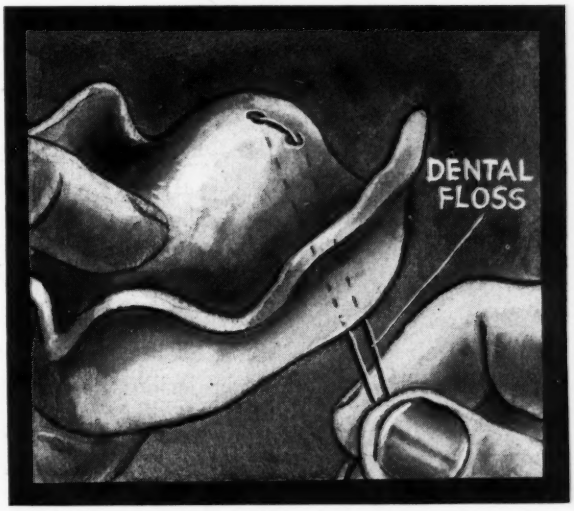


5

Removal of a Full Upper Impression

Jesse Bresloff, D.D.S., Rochester, N.Y.

6. Two holes are drilled near the posterior border of the impression tray. Dental floss is threaded through these holes. When the impression material has set, pull lightly on the two threads of floss to dislodge the impression. These procedures prevent damage of the peripheral trim.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 138 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S *Page*

PAIN ALONG the distribution of the fifth cranial nerve is a common complaint among dental patients. Patients frequently ask us if facial pains and headaches may be of dental origin. Many of them are. As Wolff and Wolf[1] have described with clarity, irritation of a sensory nerve may produce pain at the site of irritation, referred or irradiated pain in tissue distant from the point of irritation, and often secondary involvement of tissue supplied by motor nerves and represented by muscle pains and spasms. Involvement of the autonomic nervous system may create disturbances of circulation. For example, the dental pulp may be irritated by a carious lesion. Inflammation develops. Pain may be low grade or intense, localized or irradiated over any area supplied by the trigeminal nerve. The pain may be so intense as to produce spasms in the facial muscles or muscles of the back of the neck. The skin of the face overlying the pain site may be reddened.

On occasion we have been confronted with facial pains and have been unable to find loci of irritation in the dental tissues. Consultation with medical colleagues has been likewise unproductive. In such cases we have often labelled the pain as psychogenic but have not been entirely clear in our own minds in what the label meant. In other cases we have prescribed analgesics or have been hopeful that time with a healing quality would make the pain less.

Although we know that disturbances in our emotional world may produce headaches, abdominal cramps, chest pains, and a constellation of other distressing feeling states, we have had an imperfect picture of how emotional stress might produce facial pain.

In a carefully documented article Engel[2] has given the case histories of twenty patients (nineteen women, one man) who had facial pain that he considered to be an hysterical conversion symptom. After careful examination to rule out "such factors as dental disease, neoplasms, or infections about the head and neck, intracranial lesions, herpes zoster, and abnormalities of the mandibular joint, there still remained many patients whose pain could not be accounted for on the basis of demonstrable lesions. For these the term 'primary atypical facial neuralgia' was suggested."

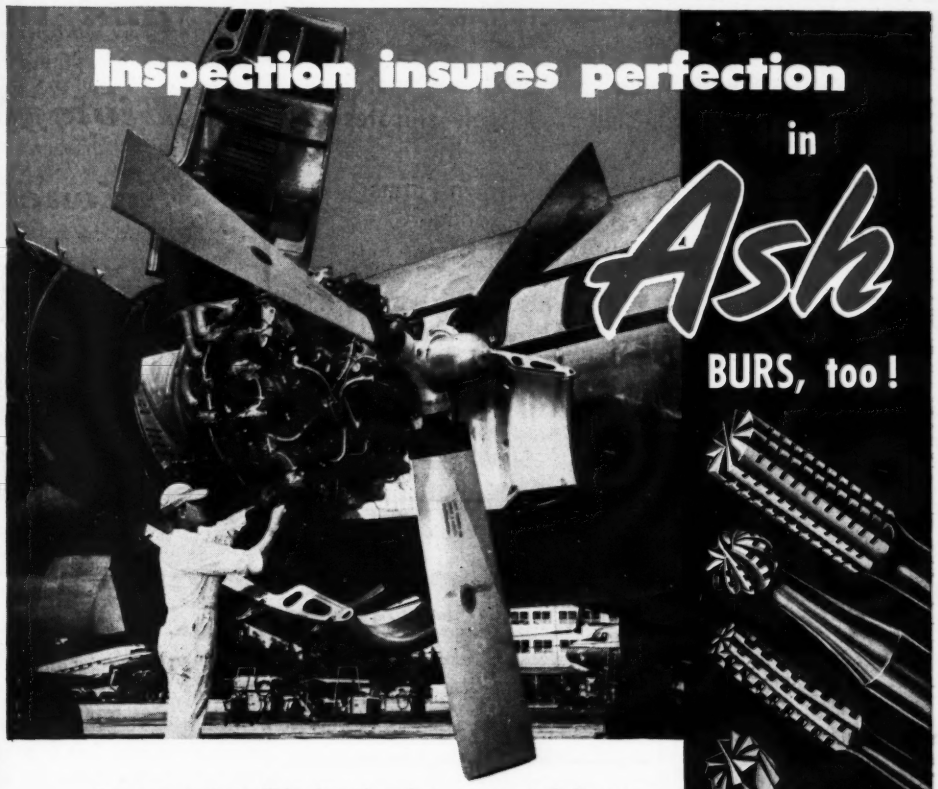
As a clue to be useful in diagnosis, Engel points out that patients with hysterical facial pain also describe a variety of symptoms involving other body structures. The multiplicity of complaints that these patients enumerate, the bizarre nature of their symptoms, suggest the possible emotional origin of the pains. The distress and suffering and pain of emotional origin is no less real to the patient than pain of "organic" nature. It is ineffectual therapy to suggest to the patient with "psychic" pain that he "forget about it," or to be more blunt, and tell him "that it is all in your imagination." Pain is pain whether it comes from the psyche or the soma. One thing that we should have learned in recent years is that the mind and body are inseparable.

In Engel's series: "In no instance was any physical explanation for the pain discovered. On the other hand, every patient proved to be seriously psychologically ill and the pain was established to be an hysterical conversion symptom. All but one patient suffered from a variety of other symptoms many of which also proved to be hysterical in origin. Unfortunately, the patients presented a consistent character structure best designated by the term *masochistic*. While not all the patients warranted the clinical diagnosis of conversion hysteria (although the face pain was a conversion symptom) all the patients showed to varying degrees this character disorder marked by many varieties of self-punitive behavior."

Dentists and physicians should be warned not to be too hasty to affix the labels "primary atypical facial neuralgia," or "hysterical facial pain" to painful conditions of the face. In any diagnostic procedure we must first make a careful examination to determine if the pain is produced by a "physical" lesion or an objective disease process. The concept of psychosomatics is no excuse for sloppy examination or casual diagnosis.

[1]Wolff, Harold G., and Wolf, Stewart: Pain. Revised Third Printing, Springfield, Illinois, Charles C Thomas · Publisher, 1951.

[2]Engel, George L.: Primary Atypical Facial Neuralgia: An Hysterical Conversion Symptom, Psychosomatic Medicine **13**:375-396 (November-December) 1951.



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Allergic Myalgia

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The response is highly variable from one patient to another. A given food may produce the same symptom pattern on different occasions. The same food may also produce symptoms localized to different muscles on other occasions. In many instances a generalized muscle soreness and aching may be present on arising in the morning following the ingestion of specific allergic substance the preceding day. Many patients describe this generalized reaction as an aching all over.

Of the localized reactions, the posterior cervical muscles, particularly the trapezius and sternocleidomastoid muscles are most commonly involved. Others frequently involved are: (1) the gastrocnemius, (2) the hamstrings, (3) the lower muscles of the

back, (4) the muscles about the shoulder girdle, (5) the pectoral muscles, (6) the intercostals, and (7) the rectus abdominus.

When occurring in the shoulder girdle the reactions are confused with the diagnosis of bursitis or arthritis. When localized to the left anterior chest the reaction is immediately confused with a heart attack. When the intercostals are involved, it may suggest a diagnosis of pleurisy, pleurodynia, or spinal arthritis.

Patients with these reactions complain of their symptoms in many ways ranging from nagging sensations of pulling, drawing, tautness, and aching of the involved muscles to violent and sharply localized pain and cramping sensations, both with and in the absence of nodular areas of increased firmness and tenderness in the bellies or insertions of the involved muscles. The affected muscles commonly become more rigid during sleep so that the symptoms are apt to be accentuated on arising in the morning. This timing is also typical of the complaints of the patient with a chronic food allergy who has a high degree of specific sensitivity.

Too frequently the complaints have been regarded as of psychosomatic origin. The common muscular complaints have been described as (1) myalgias, (2) myositis, (3) muscular rheumatism, (4) fibrositis, (5) indurative headache, and (6) tension headache.

When patients complain of these symptoms it is wise to consider the possibility of susceptiblity to one or more allergins. Many patients with such chronic complaints have been relieved following adequate allergic diagnosis and the subsequent specific avoidance of incriminated allergins.

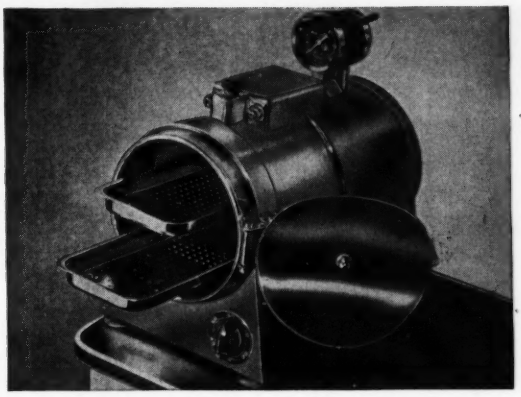
Randolph, Theron G.: Allergic Myalgia, J. Michigan M. Soc. **50**:487-494 (*May*) 1951.

Carcinoma of the Prostate

Carcinoma of the prostate is impressive because of the precipitous onset of obstructive symptoms. This is in contrast to the gradually increasing difficulty in urination over a period of years in benign prostatic obstruction.

Subjective symptoms are often misleading in making a diagnosis of prostatic cancer. Patients may report with bladder neck obstruction associated with pain in hips and legs. This distress is frequently due to osteoarthritic changes which are so prevalent at the age of fifty and over. On the other hand, the aged patient with the same type of urinary distress accompanied with anemia and loss of weight and strength presents a clear diagnostic symptom complex. This picture occurs in the well-advanced case of malignancy.

Records from representative clinics show that the number of prostatic malignancies represents .25 per cent of all admissions and 1.5 per cent of all male admissions above the age of forty-nine. Malignancy of the prostate is rare before the age of forty and increases in frequency among hospital admissions as the age of the male



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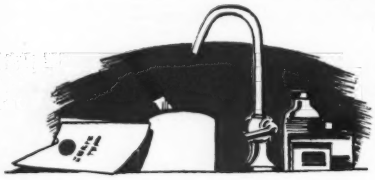

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therapeutic management is governed by the individual patient. Orchidectomy or estrogens are not used unless (1) there is obstruction of the prostate, (2) the patient is experiencing pain, (3) there is definite evidence of metastases, and/or (4) the presence of a high serum acid phosphatase level is noted.

Patients with asymptomatic extensively indurated glands receive no active treatment. They are kept under observation periodically and therapy is administered only if one of the conditions mentioned develops. To alter the androgen-estrogen balance to a more favorable status for the patient, orchidectomy is recommended.

Under such a regimen about 85 per cent of patients experience some degree of improvement varying for extremely different periods of time. In some the amelioration of symptoms extends over a space of years.

Following orchidectomy no treatment is administered until there is a recurrence of symptoms when stilbestrol orally is prescribed. The dose varies with the effect and the tolerance of the patient. When this treatment eventually fails, roentgen therapy is administered. When pain is no longer controlled by any of these means the patient may be referred to a neurosurgeon for alcohol injection of the nerve root or chordotomy. For a short period before the end many require opiates in gradually increasing doses.

Baurys, William: Carcinoma of the Prostate, Am. J. Surg. **81**:387-389 (*April*) 1951.

increases beyond fifty. From eighty to ninety its percentage of occurrence is thirty times that of the forty to fifty age group.

Digital examination remains the most reliable method of detection. Blood sedimentation rates offer little help in arriving at a diagnosis of malignancy. In the presence of a high serum acid phosphatase level there is no doubt about a diagnosis of carcinoma of the prostate. Osteoblastic and osteolytic bone metastases are always a specific and positive sign.

Of the large numbers of men who have submitted to the simple operation for the correction of prostatic obstruction, relatively few appear to develop cancer postoperatively. This is surprising because the operation does not remove the posterior lobe which contains the most potent carcinogenic elements. About 75 per cent of carcinomas allegedly start in the posterior lobe. And too, a large number of the supposedly benign glands reveal malignant niduses.

Prognosis is difficult to appraise except in the patients with recurrences. At this time the outlook is poor. The

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Contra-Angles

Less Work, Less Taxes

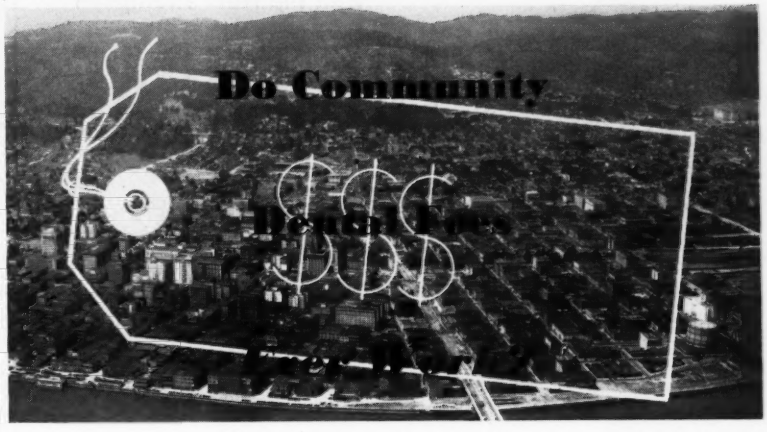
A friend of mine who has a good income was lamenting the rising income

tax rate. He has a novel and potentially dangerous plan to reduce his taxes. He is going to work less and earn less, thereby throwing himself in a lower bracket. The plan is dangerous because it reflects a fundamental change in national philosophy. The pioneer spirit, the enterprising, the energetic man of action and affairs will give way to the slothful and indolent. People are beginning to question the wisdom of a government that sets out to regulate the affairs of the world to the tune of 90c out of every tax dollar. People are losing faith in a government that is shot through with corruption, waste, and a topheavy bureacracy. Their protest over taxes is taking a more subtle and more legal form than evading taxes. Tax evasion is, quite correctly, an offense that is punishable. There is nothing, however, that can be done about the person who cuts down his production, earns less, and pays less in taxes.

Every day we hear more people say that they are getting tired of handing out 25c or more of every dollar that they touch to support people throughout the world who have no disposition to support themselves. The American people are not going on a tax strike and not many of them engage in unlawful practices to keep from paying although when the Commissioner of Internal Revenue says that 14 million out of 52 million returns contain errors, we may have some doubt.

Cutting down production is the method that may be used to reduce individual tax payments. The man who worked forty-eight hours a week is now working forty; the dentist who had evening office hours no longer does so. Once people had few and short vacations, now they take off weeks. Absenteeism and private work stoppages are increasing. Workers are demanding taxfree benefits rather than increased wages. People are going to get out of the habit of hard work. Why shouldn't they? The one who works hard and well pays an excessive share of his earnings to support the lazy at home and abroad. Our creeping national indolence despite technologic advances will one

In your ORAL HYGIENE this month



There used to be a time when March meant tulips rather than taxes and the first signs of spring were not necessarily dollar signs . . . Today, of course, we're resigned to having our spring fever complicated by financial concern.

To help you solve some of the pocket-book problems you'll be mulling over, here are four short interesting articles that contain much useful information.

★ ★ ★

Doctor David Tabak reaches some rather startling conclusions in his article, "Do Community Dental Fees *Ever Work?*" Here's an example:

"So long as the dentist continues to be both a physician and a mechanic, a professional and a tradesman, he will be torn between the proud dignity of a 'doctor' and the compulsion of the market place."

★ ★ ★

Then there's Doctor John W. Cooke's excellent analysis of the dentist's present predicament, "High Fees to Suicide." He suggests that the general practitioner "should acquaint himself with the circumstances of his own group of patients. He should understand that it is better to charge fees that can be paid than to attempt to put fees so high that they will be ignored."

★ ★ ★

Another pair of articles discusses the important subjects of investments and insurance. "How to Invest in Open-End Trust Funds" describes a service which offers *professional selection* and *continuous supervision* of your investments whether these investments are to assure you reserves, security, income, an increase of market value, or a combination of all four objectives.

★ ★ ★

"For Your Family's Sake" discusses the first concern of every man with dependents—their welfare in case of his death or disability.

★ ★ ★

If you're tired of finances for the moment, and want an interesting five-minute interlude, try the article, "Quiz Relaxes Nervous Patient." The devices described may prove equally effective in relaxing the dentist himself.

★ ★ ★

Then there's the humorous-serious article, "Be Sure Your *New* Dentistry is *New*," in which a dentist with a long memory tells the *past* history of today's "discoveries." You'll smile with him as he explains that many an innovation is not only current but *re*current.

★ ★ ★

Here's an unusual story of a dentist who plays an important role in plans for the defense of our Pacific coastline. Doctor Frank R. Burton leads an auxiliary Coast Guard flotilla in civilian maneuvers in his own cabin cruiser, the "Eloise."

★ ★ ★

Of course, in addition to these articles, you will find all of the regular monthly departments and features rounding out an interesting cross-section of dental thought and opinion.

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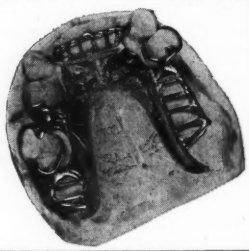

day show a severe deficit in our production. When our production lags our ability to defend ourselves is in danger. Senator Harry F. Byrd of Virginia has said that government waste and excessive taxes are "as perilous as war itself." We may also note that falling production because of self-imposed curtailments to cut down taxes will threaten our defense. Excessive taxation may destroy the nation that excessive taxation was supposed to protect and defend.

Here is Senator Byrd's report to the American taxpayer:

"Between the day in 1789 when George Washington took oath as our first President and April 30, 1945, the month in which Mr. Truman inherited the presidency, the United States Government collected from its citizens a total of $248 billion in taxes. Between April 30, 1945, and June 30, 1951—all within the life of the present Administration—the Government's total tax collection was $260 billion. In six years, the Truman administration has taken more from the American people than all the domestic taxes our Government levied in the previous 156 years. No wonder the Administration hopes that our citizens will have a 'mental rest' from thoughts like these.

"Figures which run into the scores and hundreds of billions are not butterfly statistics. Consider the appropriations of the last three years. Congress appropriated:

$50.222 billion for 1950
$87.445 billion for 1951
$94.429 billion for 1952

"Does anyone who understands arithmetic believe that the United States Government can long continue to spend at the rate of one-third of its citizens' total income? Time and again in Senate Finance Committee hearings Treasury officials admitted that there is a limit to what our people can pay in taxes and still maintain a free economy. But they declined to estimate what proportion of the national income may be taxed with safety. 'How high,' I asked Secretary Snyder, 'do you think we can take the Federal debt and maintain confidence in the Government's integrity?'

" 'I feel that it would be a rash prognosticator who would give a categorical answer to the question,' he replied. 'The only guide I know is that we avoid adding to the debt as long as that is possible and that we reduce the debt as quickly as we can.'

"If the Treasury is unwilling or unable to describe boundaries beyond which heavier taxation and increased debt would endanger our economic system, what other policy can we expect from the Administration than one of boundless spending, confiscatory taxation and stratospheric debt? Like the rest of us, Mr. Truman and his financial advisers have had much to say about the urgency of eliminating unnecessary non-defense spending. They profess to have cut operating expenses of all civilian agencies to the bone. Notwithstanding these undiscoverable economies, the President asked Congress for $9.8 billion —$1.2 billion more than in the previous year's budget—for strictly do-

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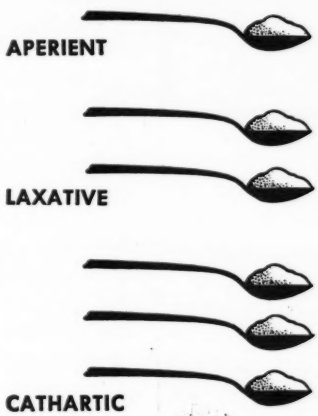

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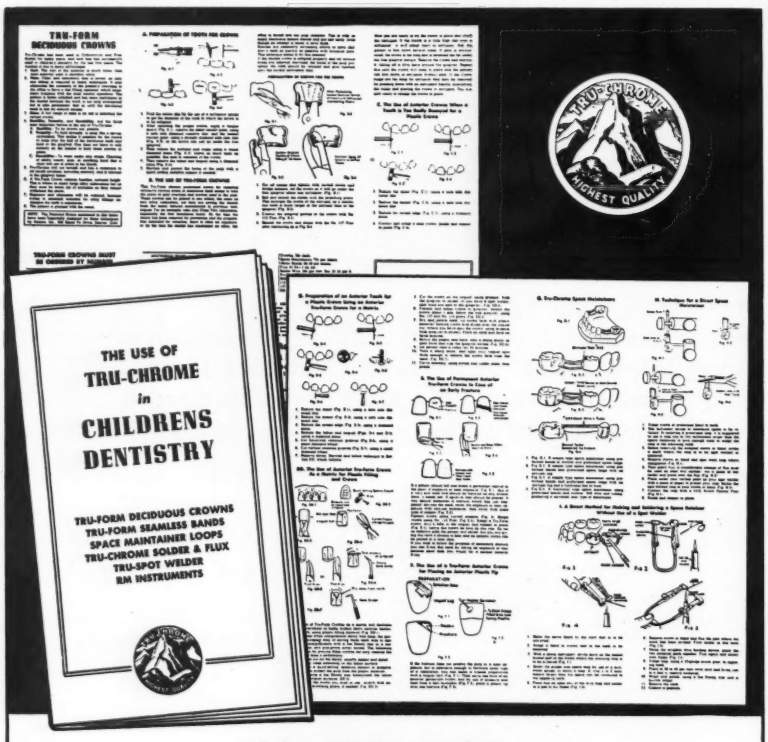
mestic-civilian expenditures, exclusive of the military and related items, exclusive of foreign aid, exclusive of interest on the public debt and exclusive of expenditures for veterans. These peacetime non-defense expenditures are greater than at any time in the history of our Government, and this at a time when by every impulse of economy and judicious management we should be spending less.

"Much of the budget would require special legislation before appropriations could be cut. The American people are unaware of the shocking fact that Congress has lost immediate legislative control over most Government funds and property. The President's budget of January 1951 totaled $71 billion. (Requests for additional appropriations brought the figure up to $94 billion.) Of the original budget, only one-third came under annual review and control by Congress. This comprised some $19 billion of military and international expenditures and less than $5 billion in domestic nonmilitary expense items. The relatively uncontrollable remainder consists of such items as interest on the public debt, grants to States and veterans, and other commitments made by previous legislation.

"There can be little reduction in Government expenditures until Congress regains control over them. 'The time has come,' testified Lindsay Warren, Comptroller of the United States, 'to reexamine grants to executive officers and final and conclusive authority over their spending operations, to reevaluate them and to determine whether some or all of them should not be repealed or greatly modified.'

"Tremendous savings can be made by reduction or elimination of programs specifically prescribed by law. Last year I indicated where $7 billion might be saved by such a process, and it is an interesting coincidence that the Treasury now anticipates a $7 billion deficit next June. In the matter of these reductions, the Chief Executive has some responsibility of leadership. To date, such leadership has not been manifest, for I do not recall a single suggestion from the White House about curtailment or repeal of any of these programs. On the contrary, we have had a stubborn, persistent demand—backed by high-powered, expensive propaganda paid for by the Government—for socialized medicine, socialized housing and for greater Federal control of education."



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Banquets and Microphones

The dental banquet is receding in popularity. The reasons are many: too much money per plate, abominable food, corny entertainment. The medical journal GP describes another reason, called aptly, banquet barbarism:

"In the last half century doctors have mercifully abandoned the once popular pastime of bleeding the sick. But a sadistic barbarism peculiar to our profession is the cause of almost as much needless suffering.

"Consider the horrible lot of the distinguished guest speaker who is compelled to sit at a banquet table for two or three hours while a grinning toastmaster introduces half a hundred officers, committee members, guests, friends, and visiting firemen. Ponder the mortal anguish and ex-

sanguination he suffers as first one and another is called upon for 'a few appropriate words.'

"All this, mind you, is considered preliminary to the *pièce de résistance*, the principal address. By the time the presiding officer finally gets around to the 'extreme pleasure' of introducing the speaker of the evening, that poor soul is weary, bored, and dispirited. So is the audience.

"A man who has gone to the considerable trouble of preparing a feature address and who has frequently traveled thousands of miles to deliver it deserves better than this kind of treatment.

"A few weeks ago we watched a distinguished senator undergo this altogether too frequent insult. When the audience was thoroughly surfeited and ready to go home, when the clock showed eleven o'clock, the speaker was grandly introduced.

"It was too much. The carefully prepared and accurately timed discussion the speaker had intended to present had long since been smothered by a rising indignation. The speaker was fully aware of the well-known psychological precept that the human mind can absorb no more than the human seat can endure. With ill-concealed choler, he spoke for a few minutes and sat down.

"This barbaric, uncivilized, and impolite practice should stop. Here and now we undertake a crusade to spare distinguished speakers from the cruelty of the banquet ordeal. We urge all those presiding at such functions to introduce the speaker first in the course of events, immediately following the dinner. Give him an opportunity to present his address to an alert and interested audience, and give him the time he requires.

"Then, when the principal address is concluded and the speaker has been duly thanked, the round of introductions, funny stories, committee reports, and mutual admirations can begin. They can go on as long as anyone desires. Those who find it boring can depart, including the guest speaker."

Banquet barbarism is not an exclusive feature of the North American continent. In England the protest is directed to the microphone nuisance. The *British Medical Journal* carries this lament:

"Now that the congress season is upon us, can nothing be done to abate the nuisance of the microphone and amplifier? For three days at the recent Congress of Obstetrics and Gynecology every speaker was accompanied by an amplifier on a huge pedestal which he trundled about with him on the platform when he went to the lantern screen to expound his pictures or came to the footlights to put a point directly to his audience, and the microphone had to be readjusted in height for each successive speaker. Almost every speaker spoke into it as if it were a telephone receiver, and many clung to it as if they were shipwrecked and it was a raft. The result was a constant falsification and degradation of the voice, especially for those in the front of the auditorium who lost a great deal of what was said. It is said that the motor-car is depriving man of the use of his legs; the microphone and amplifier will soon be depriving him of audible and intelligible speech."

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CLINICAL AND LABORATORY SUGGESTIONS
(*See pages* 126 *and* 127)

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SEE PAGE 130

The deep freeze allows every family the most exotic foods that their money can buy. The anemic turkey and the sad salads of the banquet are poor competition. Television brings the best kind of entertainment with the blessing that any speech, any singer, any dancer, can be ejected from the scene with a twist of the wrist. Dentists are not going to pay seven to ten dollars a plate for a poor meal and doubtful entertainment. The banquet as a social institution is dying and well that it may. I hope that the demise of the shrill cocktail party will soon follow.—E. J. R.

The Danger of Painless Cavity Preparation

MORE AND more the patient is expecting and demanding painless dentistry. And unfortunately, it would seem that dentists more and more are endeavoring to give their patients just what they expect and demand. The patient leaves his dentist singing his praises, but the aftermath is not always so joyful. Then come dead pulps and occasionally abscesses and extractions.

It is not our contention that anesthesia is always superfluous. The extensive preparation for a three-quarter crown can be so rugged that anesthesia is essential for making a good restoration and for the comfort of the patient. Likewise, some cervical cavities can be exceedingly painful, thus making anesthesia necessary. Nevertheless, we contend that the use of a water spray often makes anesthesia unnecessary and that the rapid operative technique possible under anesthesia harms the pulp through frictional heat.

Pain is generally thought of as a curse, and in the case of a person who suffers from it, this is not to be wondered at. From the scientific viewpoint, however, pain might better be considered as a blessing, for certainly it serves to warn and safeguard against injury. Without sensory nerves and the pain transmitted by them, we could sit quietly on a red hot stove and notice nothing until

we saw the smoke curling up around us . . .

There is ample experimental evidence that the extensive, rapid preparation of cavities results in pulp changes, particularly in recently erupted teeth. Sometimes repair takes place, but often the pulp is weakened and becomes susceptible to infection by the blood stream and eventually dies a lingering but often painless death. Some may say that if this be true, our patients must have countless numbers of sick and dead pulps. This indeed is the case. The reason so few do "blow up" is that they die in a sterile condition and can remain so for many years. Only by ill chance are some dead pulps infected by the blood stream and only then cause abscesses. The patient and often the dentist does not connect such a "blow up" with the operative procedure which harmed or killed the pulp years before. They think it just happened or that it is their bad luck. It is well known that the heat engendered during cavity preparation is probably the chief malefactor in producing pulp changes.

The dentist who endeavors to practice painless dentistry by anesthetizing his patient and thus freeing him from the pain of cavity preparation at the same time destroys the patient's power to feel the pain which would act as a warning and a deterrent to excessive frictional heat and consequent injury to the pulp.

There is a way to practice almost painless dentistry in preparing many cavities but it is not by way of rendering the sensory nerves unconscious to heat. As has been emphasized by many authorities, the way is to use *new* burs which cut quickly with a minimum of frictional heat and to keep the cavity cool by a steady stream of water. It must be admitted that this takes more care and time but there is no doubt that if these precautions are followed there will be fewer dead pulps.

Many a beautiful restoration is a tombstone under which lies buried a dead pulp.

Editorial from *New York State Dental Journal* **18**:39-40 (January) 1952.

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Functions of Saliva

THE FUNCTIONS of saliva are varied. On the mechanical side there are the following actions: (1) The prevention of desiccation of the oral membranes and dental hard structures. (2) Flushing the surfaces of the teeth and mucous membranes of food and debris. Flushing bacteria from ducts and surfaces is a safeguard against infection. (3) The motion of the tongue, lips, cheeks, and soft palate, together with the acts of chewing, swallowing, and spitting which contribute to the removal of organisms from the mouth.

Bactericidal Defenses

(1) Salivary flow is increased considerably in the presence of irritating substances thereby diluting them. (2) The proteins and salts of the saliva act as buffers which minimize pH changes in the oral cavity.

Possible Caries Prevention—There is some indication that saliva normally contains antibacterial factors

which inhibit the growth and activity of aciduric bacteria and may thus aid in caries prevention. Two such agents have been demonstrated in saliva: (1) One is effective against micrococci, sarcinae and bacilli found commonly in air and water. (2) The other, while less potent, effectively kills or prevents growth of those organisms which are not permanent members of the mouth flora.

Inhibitive Effects—Hemolytic streptococci are destroyed but mouth streptococci survive in filtered saliva. Organisms such as typhoid bacilli, colon bacilli, and staphylococci are completely inhibited. This may explain the fact that suppurative conditions are rarely found in areas freely accessible to saliva but are more common in protected sites such as deep pockets and abscesses.

Chemical Composition

Saliva is a mixture of the secretory products of various glands. The rate of flow and resultant composition of saliva is directly influenced by such diverse factors as the following: (1) Mastication, (2) general health, (3) respiration, and (4) taste and smell.

Other Salivary Constituents—Opinions vary concerning salivary constituents. An authority has found high potassium content to be associated with active caries. It has been suggested that the ammonia content is related to caries although other researchers believe it has no bearing on the caries incidence.

Blood Coagulation: It has been shown that the saliva has the property of speeding blood coagulation. It is not suggested that this would have any significance in excessive hemorrhage although it no doubt plays a part as a hemostatic agent for minor oral injuries.

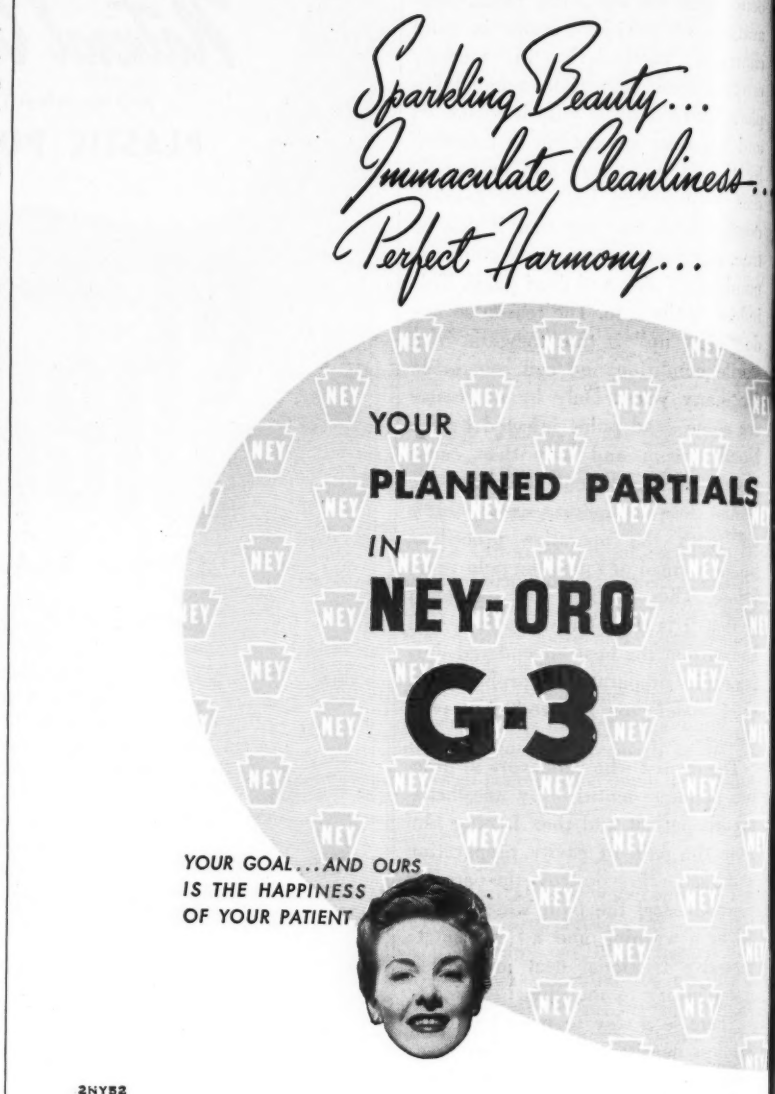
Leukocyte Attraction: The ability of saliva to attract leukocytes has been demonstrated. It was found that cells of the blood are attracted to capillaries containing saliva to a greater extent than if the capillaries contained only tissue exuduates.

Relation of Saliva to Caries

Persons with a copious flow of stimulated saliva are less susceptible to caries while those with no saliva invariably have rampant caries. There appears to be little difference in caries activity between persons having a moderate and a copious flow of saliva.

It is known that a stimulation of the sympathetic nervous system will cause cessation of salivary secretion and it has been suggested that caries activity increases in times of stress. If so, this may account for increased caries activity during pregnancy.

Adapted from *Journal of the Canadian Dental Association* **17**:619-620 (November) 1951.



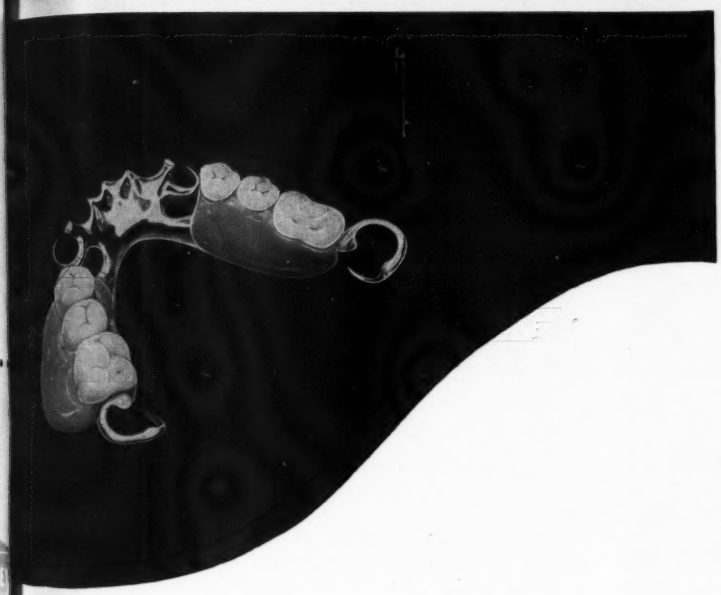
Classifications and Corrections of the Mandible for Full Denture Prosthesis

(*Continued from page* 112)

and 12). Fournet teeth are produced with deep and shallow cusps.

In unfavorable conditions, such as with a patient having a high, spiney ridge, flabby ridges, or diabetes, teeth with shallow cusps are recommended (Figs. 10, 11, and 12).

Use of Articulator—The Fournet



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1. Many dentists believe that within reason the condyle will accept the conditions imposed by the construction of the denture and that the 16-inch sphere of the articulator is satisfactory.

2. Final adaptation of the teeth to the patient's individual movements is secured by some operators by spot grinding with or without a central bearing point after the dentures are inserted.

3. Final adjustment is gained in some cases by permitting the patient to chew carborundum paste for a few minutes after dentures are inserted.

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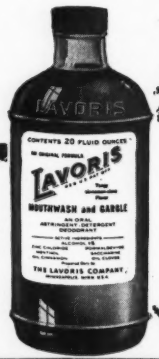

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